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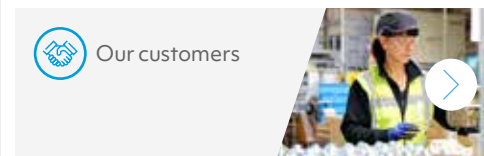
A BETTER TOMORROW

VESUVIUS PLC

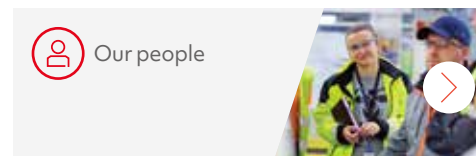
Sustainability Report 2024

Welcome

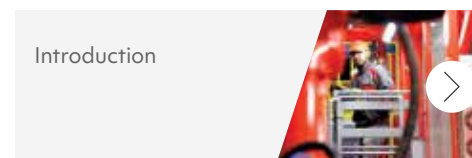
As a global leader in molten metal flow engineering and technology, we work closely with the most advanced steel-makers to develop refractory products for the steel-making and casting processes of the future.



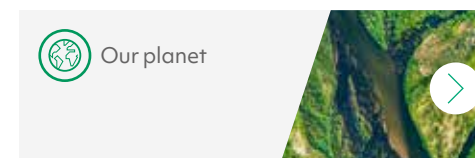
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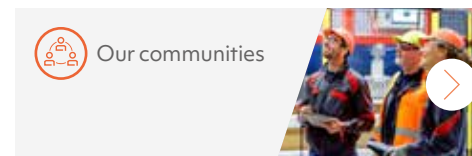
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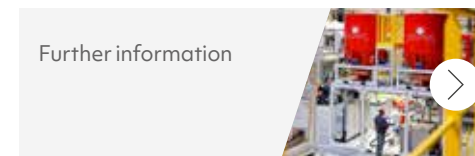
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Further information


Forward-looking statements

This Sustainability Report contains certain forward-looking statements with respect to the operations, strategy, performance, financial condition and growth opportunities of the Vesuvius Group. By their nature, these statements involve uncertainty and are based on assumptions and involve risks, uncertainties and other factors that could cause actual results and developments to differ materially from those anticipated.

The forward-looking statements reflect knowledge and information available at the date of preparation of this Sustainability Report and, other than in accordance with its legal and regulatory obligations, the Company undertakes no obligation to update these forward-looking statements. Nothing in this Sustainability Report should be construed as a profit forecast.

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 

Visit our website at www.vesuvius.com

Visit our online Annual Report at report2024.vesuvius.com



Introduction



We think beyond today's solutions and shape the future through innovation.

Our purpose

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

We think beyond today to create the innovative solutions that will shape the future, delivering products and services that help our customers make their industrial processes safer, more efficient and more sustainable.

In turn, we provide our employees with a safe workplace where they are recognised, developed and properly rewarded, and aim to deliver sustainable, profitable growth to provide our shareholders with a superior return on their investment.

We create innovative solutions that help our customers improve their safety and quality performance, reduce their environmental footprint, become more efficient in their processes and reduce costs.

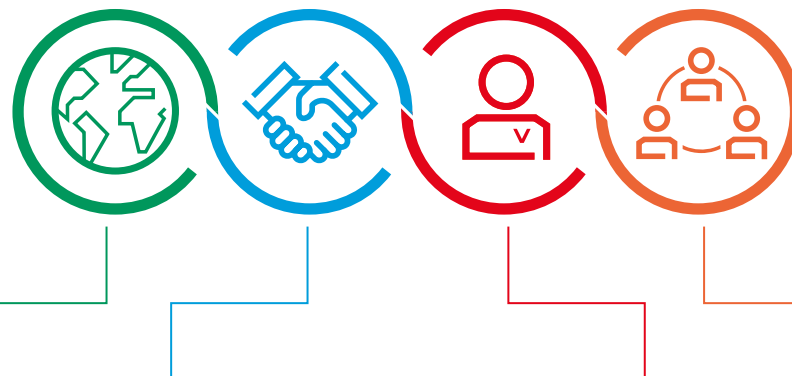
We work in close partnership with the most advanced steel-makers to develop the refractory products for the steel-making and casting processes of the future.

Our sustainability initiative 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 our strategic priorities.



Our sustainability strategy: Towards a better tomorrow

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 sustainability impacts, risks and opportunities.



Our planet

Our objectives

- To tackle climate change by reducing our CO₂e emissions and helping our customers reduce theirs with our products and services. We are committed to reaching a net zero carbon footprint at the latest by 2050 (Scope 1 and Scope 2)
- To engage in the circular economy by extending the lifetime of our products, reducing our waste, recovering more of our products after they have been used and increasing the usage of recycled materials

P30 ➤

Our customers

Our objectives

- 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, and especially their CO₂ emissions

P67 ➤

Our people

Our objectives

- 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 attract talents and offer growth opportunities to all our employees through training and career progression to develop diverse, engaged and high-performing teams

P80 ➤

Our communities

Our objectives

- To support the communities in which we operate, with a 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

P110 ➤

Progress on our sustainability roadmap

Alexander Laugier-Werth
VP Sustainability, HSE & Quality



Welcome to our fifth Sustainability Report. I thank you very much for your interest in Vesuvius' journey.

The fight against climate change requires the steel and foundry industries to decarbonise their production processes whilst developing higher-performance metals, and larger and more complex castings.

Vesuvius helps address these challenges through our refractory products and engineering solutions designed to:

- Improve the operational performance of casting processes
- Reduce energy and resources wastage
- Allow customers to produce more advanced steel grades

These elements are essential to help our customers and downstream industries become more sustainable.

Parallel to this, we need to improve our own sustainability performance.

The Vesuvius sustainability strategy brings together all our Environmental, Social and Governance initiatives into a single coordinated programme, fully integrated in the Group's business strategy. The sustainability strategy

is built on four pillars: our planet, our customers, our people and our communities.

We have set out four key sustainability strategic priorities:

- Become a zero-accident company
- Reach net zero CO₂e emissions by 2050 (Scope 1 and Scope 2)
- Help our customers reduce their CO₂ emissions
- Improve gender diversity at every level of the Company

Targets for three of these are embedded into our management incentive arrangements.

We are signatories to the UN Global Compact (UNGC) and report annually on our sustainability activities, commitments and progress. We are very proud of our progress to date and of the recognition we have received from leading rating agencies.

In 2024, Vesuvius maintained an AA rating from MSCI, while receiving a silver medal from EcoVadis and a B grade from CDP.

We have come a long way in our sustainability journey, particularly in setting up the organisation, building our roadmap to net zero, and, more recently, updating our materiality

assessment and focusing on execution and delivery. In 2024 we used the outcome of our Double Materiality Assessment to define the main Sustainability KPIs which we will monitor during the 2025-2030 period. In 2025, we will set the 2030 Targets for our main Sustainability KPIs.

We are committed to transparent and thorough reporting on our sustainability performance. In 2024, we focused on improving the quality of our internal environmental reporting. We conducted training sessions and carried out extensive verification of our environmental data going back to 2019. As a result we have updated some of our prior year reporting. The historic data in this report reflects these amendments, none of which were material. Readers wishing to see the changes versus last year's report will find detailed tables showing data before and after these amendments in the Further Information section.

Following an incident which incapacitated one of our rotary kilns, our production of dolime was considerably reduced throughout 2023. Output levels started increasing again in 2024, although at a much lower level than prior to the incident. As the dolime product line is the largest contributor to the Group's CO₂ emissions, any change in volume affects environmental performance

comparisons with prior years and with the 2025 target. In this Report, we have therefore reported some pro forma numbers, as if the dolime process had been operating normally throughout the year (based on the average output from 2019 to 2022) to preserve meaningful comparability.

The scope of this report covers 100% of activities inside Vesuvius operational control boundaries, matching the Group's financial reporting perimeter.

We are monitoring the introduction of ISSB standards in the UK and going forward our reporting will reflect changes in the regulatory landscape. We have also started work on the European Union's Corporate Sustainability Reporting Directive (CSRD) and European Sustainability Reporting Standards, which will currently be applicable to Vesuvius plc in 2029. In 2024, we carried out a gap assessment between our 2023 sustainability disclosures and the CSRD requirements, built adequate plans and started addressing some gaps.

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

Alexander Laugier-Werth
VP Sustainability, HSE & Quality

Note: The content of this Sustainability Report is primarily based on our materiality analysis, feedback from our internal and external stakeholders, and the requirements of the UN Global Compact. It covers 100% of our operations (owned and joint ventures).

Waste and recycling data contained in this Report as well as the energy and Scope 1 and Scope 2 GHG emissions data are re-baselined from 2019 onwards using pre-acquisition data for the business acquired from Universal Refractories, Inc. (Vesuvius Penn Corporation) at the end of 2021 and BMC (Yingkou YingWei Magnesium Co., Ltd) acquired late in 2022.

Scope 1, Scope 2 and Scope 3 carbon footprint reporting and supporting evidence contained herein for the period 1 January 2019 to 31 December 2024 covering GHG emissions as CO₂e in metric tonnes, CO₂e intensity in metric tonnes of CO₂e per metric tonne of product packed for shipment, energy consumption in kWh and energy intensity in kWh of energy per metric tonne of product packed for shipment, location-based and market-based, were verified by Carbon Footprint Ltd in accordance with the ISO 14064 Part 3

(2019): Greenhouse Gases: Specification with guidance for the verification and validation of greenhouse gas statements. The report has not been externally assured in its entirety. Senior management are involved in the ongoing review of the collection, management, verification and assurance of reporting information.

A copy of the limited assurance statement can be found on our website: www.vesuvius.com.

Highlights

Our 2024 performance

Lost Time Injury Frequency Rate per million hours

0.52

2024 0.52

2023 0.60

2022 1.08

Reduction in Scope 1 and 2 CO₂e emission intensity per metric tonne of product packed for shipment versus 2019¹

-26.9%

2024 -26.9%

2023 -20.7%

1. Pro forma performance calculated as if dolime production had been operating normally in 2023 and 2024. The actual reduction in Scope 1 and 2 CO₂e emission intensity in 2023 was 45.9% and in 2024 was 40.4%.

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

Help our customers reduce their CO₂ emissions

Basilite Quickstart*

Eliminates the need for energy-intensive flame drying of tundish linings prior to steel production, reducing both energy consumption and CO₂ emissions in the steel-making process.



DuraSleeve*

Its enhanced erosion-resistant technology extends casting duration and reduces energy waste by minimising essential production stops.



SEMCO*

Fast-drying and colour-change coatings cut drying times compared to traditional water-based coatings, resulting in lower energy consumption for drying, whilst optimising casting productivity.



At a glance

Our divisions

Steel

We are a world leader in the supply of refractory products, systems and solutions to steel producers and other high-temperature industries, helping our customers increase their efficiency and productivity, and enhance their quality and safety.

What we do for our Steel customers

We supply refractory products, flow control systems and process measurement solutions to our Steel Division customers

We combine these with robotics and mechatronic installations to increase their efficiency, lower their costs and improve their safety and product consistency

Our solutions address the key challenges of our customers in the steel industry, such as maintaining steel quality and reducing energy usage during the casting process

Our products and their applications preserve the purity of the steel as it moves through the production process, from initial refining to the cast steel slab, bar or ingot

Revenue: **£1,343.8m** Trading profit: **£153.0m**

Flow Control

We supply the global steel industry with consumable ceramic products, systems, robotics and digital services for the continuous casting process.

Revenue

£769.0m

Key products

VISO (isostatic tubes, stoppers and nozzles) **c.45%**

SLIDE-GATE (refractories and systems) **c.35%**

OTHER (including fluxes, purging plugs and robots) **c.20%**



Advanced Refractories

We supply specialist refractory products designed to enable steel-making equipment to hold the molten metal.

Revenue

£535.6m

Key products

UNSHAPED (AlSi and basic monolithics) **c.55%**

SHAPED AND OTHER (including bricks and precast) **c.45%**



Sensors & Probes

We supply a range of products that enhance the control and monitoring of our customers' production processes.

Revenue

£39.2m



At a glance

Our divisions

Foundry

Operating under the Foseco brand, we are a world leader in the supply of consumable products, technical advice and application support to the global foundry industry, helping our customers to improve their casting quality and foundry efficiency.

What we do for our Foundry customers

We provide customisable products and process technology to foundries that improve the quality of their castings

We combine this with technical advice, application engineering and computer modelling to improve process outcomes

Our solutions address our Foundry customers' key challenges of casting quality and production efficiency

Our products and solutions clean the molten metal, improve the solidification of that metal, and reduce wastage in the final casting

Revenue: **£476.3m**

Trading profit: **£35.0m**

Product demand is driven by higher sophistication, demanding higher-quality metal and more complex castings.

Key products

FEEDING AND FILTRATION **c.40%**

BINDERS AND COATINGS **c.30%**

OTHER (including crucibles and melt-shop products) **c.30%**

Customers

Foseco's primary customers are ferrous and non-ferrous foundries serving various end-markets from large bespoke castings to high volume automotive pieces. Most of Foseco's customers serve the general industrial market.

78%

22%

General industrials¹

Light vehicle market

1. General industrials includes: mining, agricultural, general engineering, heavy trucks and other industrial applications.

At a glance

6 Continents	40 Countries	68 Sales offices
6 R&D centres of excellence	54 Production sites	



Our worldwide footprint, with a focus on the world's growing markets, enables us to capitalise on shifting dynamics in the global steel and foundry markets.

Breakdown by region

Americas

3,146 employees

19% FOUNDRY
81% STEEL

£633.5m

Revenue

EMEA

4,309 employees

30% FOUNDRY
70% STEEL

£603.1m

Revenue

Asia-Pacific

6,260 employees

30% FOUNDRY
70% STEEL

£583.5m

Revenue

Our business model

Key features of our business model and strategy

Our purpose

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

We think beyond today to create the innovative solutions that will shape the future, delivering products and services that help our customers make their industrial processes safer, more efficient and more sustainable.

In turn, we provide our employees with a safe workplace where they are recognised, developed and properly rewarded, and aim to deliver sustainable, profitable growth to provide our shareholders with a superior return on their investment.



How we create value

Our strengths



People

We have more than 11,000 people and more than 2,000 directly supervised contractors in our skilled and motivated workforce



Assets

Our global footprint of 54 production sites on six continents places us in close proximity to our customers



Intellectual capital

We have six R&D centres of excellence and dedicated R&D staff worldwide, generating innovative products and services



Financial capital

We have a strong balance sheet and use the cash generated by our business to invest in innovation, people, operating assets, technology and sales, to generate further growth



Global supply network

We work closely with a wide range of suppliers to establish reliable and well-developed sustainable supply chains to secure high-quality raw materials



CORE Values

We champion our Values of Courage, Ownership, Respect and Energy, and our ethical approach to business conduct

Key features of our business model and strategy

How we make a difference

Innovation

Our network of talented scientists and technicians create differentiated products and solutions, allowing us to maintain our technology leadership and solve our customers' most difficult problems through innovation

Customer knowledge

Our customer intimacy and deep knowledge of their processes and requirements give our engineers an unparalleled ability to deliver on customer needs

Global presence

Our global footprint enables us to capitalise on shifting dynamics in the global steel market, responding to our customers' needs where they are growing

Efficiency

Our continuous focus on improvements in our manufacturing base, and IT and support functions, along with the automation of production processes, reduces our cost base and maintains the efficiency of our operations

Value for customers



Safety – Better working environments



Quality – Optimised products driving higher-quality steel, and better castings



Efficiency – Cheaper casting and steel through reduction of input costs and improved operational efficiency



Sustainability – Less energy usage and reduced wastage resulting in lower CO₂ emissions in our customers' processes

Collaboration with our Steel and Foundry customers

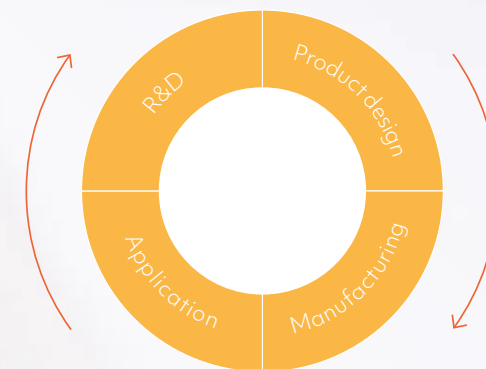
Our customers constantly innovate to enhance their product portfolio and the performance of their manufacturing processes, and they expect their suppliers to do the same. They seek value-adding solutions, with a high level of reliability. Quality demands from our customers' end-customers are high and constantly increasing, requiring sustained levels of innovation and support.

We enjoy leadership positions, with strong recognition of our Vesuvius and Foseco commercial brands, a global customer base and manufacturing footprint, where we pride ourselves on our above average R&D investments to ensure we deliver technologically differentiated solutions.

Our local manufacturing, local expertise and a deep and thorough understanding of our customers' processes gives us a special relationship with our customers. We ensure a high level of customer intimacy through a strong network of account managers, regular contact between experts and joint development projects.

We focus on the high technology segments of the market which demand higher performance products; this enables us to deliver better margins. We continuously invest in R&D to design solutions and customise products for customers.

Our six R&D centres are located in each major customer market in areas with access to vast pools of talent in many different domains. We also partner with universities, scientific institutions and equipment manufacturers to investigate and evaluate new technologies.



Key features of our business model and strategy

Our business model and strategy prepare us well for the future

We believe that we operate a strong and resilient business model. We anticipate long-term positive growth trends in both our main end-markets – Steel and Foundry.

Steel is used in a wide range of applications, with the array of different steel grades offering material properties that are fit for many different purposes. The absence of alternative materials with comparable performance and cost effectiveness, the size of the market and the infinite recyclability of steel ensure the long-term resilience of the steel industry.

In addition, due to steel's chemical and physical properties, all steel-making processes require consumable materials that can withstand high temperatures. No alternative materials offer the same level of performance at comparable cost as refractory ceramics.

Similarly, our strong presence in non-ferrous foundries will help us to offset the inevitable decline in iron casting for automotive combustion engines with the expected growth in aluminium castings driven by the increased uptake of electric vehicles.

The vast majority of greenhouse gas emissions in steel occur in the process steps upstream of the casting operation. Changes in steel-making technologies and processes which are required to decarbonise will therefore take place upstream of the caster area where the Steel Division of Vesuvius generates more than 70% of its revenue. The most notable trends will be the growth of the H2-DRI (Direct Reduced Ironmaking) and Electric Arc Furnace routes. Investments under way or announced tend to indicate that this transition will occur over multiple decades, and possibly not completely.

We are strategically positioned in the most demanding segments of high technology steel which is expected to grow faster than the industry. As the distribution of steel production around the world continues to evolve, we adapt our manufacturing footprint to match the steel-making capacities in each region.

Customer efforts to decarbonise their operations will require better performing refractory materials, reinforcing the need for Vesuvius products. Taxation of emissions will further increase the financial burden on steel-makers, simultaneously enhancing the value of our products and motivating customers to invest in our innovative solutions.



Overview of our value chain

The following table outlines the Vesuvius value chain, derived from Company subject matter expert estimations, comprehensive market analysis and extensive industry experience.

	Steel industry	Foundry industry	Materials suppliers
Key characteristics	<ul style="list-style-type: none"> – Strategic industry for many countries – Mature industry, yet very innovative – Large installations, a few hundred to a few thousand employees – Capital intensive, long life assets – Long-term growth tightly correlated with global gross domestic product (GDP) – Some are privately held, some government-owned – Steel is easily and infinitely recyclable 	<ul style="list-style-type: none"> – Contributes to many downstream sectors (i.e. automotive, mining, wind turbines) – A few trans-national groups, many small local companies 	<ul style="list-style-type: none"> – Mostly processed raw materials – Some chemical products and packaging materials – Some capital expenditure (industrial equipment) and professional services
Number and segmentation	<ul style="list-style-type: none"> – Approx. 2,200 operating casters worldwide – Long steel generally has lower performance requirements from refractories than flat steel – High-technology steel is the fastest growing segment within flat steel. It is also the one with the highest requirements from refractories 	<ul style="list-style-type: none"> – Up to 40,000 foundries worldwide – Wide variety of materials processed (iron, steel, copper, aluminium, zinc oxide...), varied production run sizes (single units to long series) – Aluminium is the fastest growing segment 	<ul style="list-style-type: none"> – Approx. 3,000 suppliers – Combination of large industrial companies and local suppliers – Mostly manufacturers transforming mined materials in high-temperature processes, chemicals manufacturers, traders
Geographic distribution and its evolution	<ul style="list-style-type: none"> – 55% of steel production in China, 9% North Asia, 8% India and Southeast Asia, 7% EU27 and UK, 6% North America, 15% rest of the world. – We anticipate that in the coming decades, India and Southeast Asia are set to grow fast, Europe will continue to shrink, China will reduce exports to reduce production, decommissioning less efficient assets. 	<ul style="list-style-type: none"> – 31% Foundry production in China, 27% in EMEA, 16% in NAFTA and 12% in North Asia – We anticipate that in the medium term, India, Southeast Asia, Turkey and Mexico will grow fastest at the expense of the more mature markets in Europe, US and North Asia 	<ul style="list-style-type: none"> – Global supply base – Suppliers mostly located near mining facilities – Some materials can only be procured in certain parts of the world, others are locally available in all regions
Our business model	<ul style="list-style-type: none"> – Selling custom consumable products (either per piece or via performance contracts) – Selling/renting/loaning equipment predominantly used for the implementation of consumables – Outsourcing maintenance of blast furnace troughs, ladle linings, tundish furniture and linings, and mechanisms – 70%+ of our revenue is from the ladle – caster area – We focus mainly on the most demanding applications (flat, high-technology steel) 	<ul style="list-style-type: none"> – Selling standard and custom products – Technical support to assist with correct product selection and application in the customer's process – Strong application engineering support to help customers improve tooling design and process performance, through on-site support and CFD simulation 	<ul style="list-style-type: none"> – Most materials procured based on tight specifications that are jointly defined with suppliers – High-volume globally traded materials managed by central team, the rest by local purchasing organisations

Table continues on page 14.

Overview of our value chain

	Steel industry	Foundry industry	Materials suppliers
How we engage	<ul style="list-style-type: none"> Account managers often based full time at customer locations Regular interactions between customer and Vesuvius experts Joint R&D projects with key strategic customers 	<ul style="list-style-type: none"> Account managers frequently visiting customers Network of application engineers for technical support and projects 	<ul style="list-style-type: none"> Technical meetings Supplier audits Supplier Sustainability Assessments
Main environmental risks and issues	<ul style="list-style-type: none"> Approx. 8% of world CO₂ emissions* Integrated steel plants emissions = approx. 2 tonnes of CO₂ per tonne of steel Electric Arc Furnace plants emissions = approx. 500 kg CO₂ per tonne of steel. 	<ul style="list-style-type: none"> CO₂ emissions Volatile Organic Compounds emissions to the atmosphere Disposal of process materials after usage 	<ul style="list-style-type: none"> Processed materials suppliers (mostly Tier 1): CO₂ emissions from high-temperature processes including geogenic emissions (hard to abate), and chemicals production Upstream suppliers (mostly Tier 2): CO₂ emissions
Main social issues	<ul style="list-style-type: none"> Employee safety 	<ul style="list-style-type: none"> Employee safety 	<ul style="list-style-type: none"> Employee safety Child and forced labour in some specific industries (e.g. Mica)
How we create value/ Sustainability-related expectations	<ul style="list-style-type: none"> Refractory materials enable the production of iron and steel by insulating it at all production stages, avoiding equipment damage, energy losses and corrosion of liquid metal The performance of our products helps reduce production inefficiencies (stoppages, steel downgrading, material losses, reduced casting speed, excessive super-heat) Longer-lasting refractory materials additionally reduce costs and drain on worldwide mined materials resources Design of tundish furniture to improve flow and temperature homogeneity, contributing to improved steel quality 	<ul style="list-style-type: none"> The performance of our products helps reduce production inefficiencies (scrap and remelting) and improve casting properties (metallurgy, surface finish) We assist customers in problem-solving and process performance improvement projects (e.g. excessive scrap rates) We assist customers in mould design to optimise metal yield In many cases we can help our customers improve the mechanical properties of the finished casting, opening up new geographic markets and new casting applications 	

Overview of our own operations

	Manufacturing	Outsourced maintenance services	R&D
Key characteristics	<ul style="list-style-type: none"> Wide range of processes and products No mining and raw material transformation, only the key process steps to make the product from its recipe, mainly mixing, forming, curing and firing, and finishing 	<ul style="list-style-type: none"> Maintenance and installation activities outsourced by Steel customers (refractory installation, equipment maintenance) often 24/7 	<ul style="list-style-type: none"> C. 2% of turnover Centres of Excellence specialised per product lines Activities ranging from support to operations to new product development and fundamental research
Number, geographic distribution and its evolution	<ul style="list-style-type: none"> Approximately 7,500 people 54 manufacturing sites All Business Units are present in all regions Our manufacturing footprint has continuously evolved to follow the long-term trends of our customers' market footprints 		<ul style="list-style-type: none"> 6 R&D centres of excellence distributed worldwide
Main environmental topics	<ul style="list-style-type: none"> CO₂ emissions (Scope 1) Accidental pollution Product quality (reduce inefficiencies in customer processes) 	<ul style="list-style-type: none"> Service quality (reduce inefficiencies in customer processes) 	<ul style="list-style-type: none"> Innovation and technology (develop products and processes helping customers improve their sustainability performance)
Main social issues	<ul style="list-style-type: none"> Employee safety Talent attraction and development 		<ul style="list-style-type: none"> Talent attraction and development

* Source : World Steel Association.

Overview of our value chain

Vesuvius Group Value Chain						
Upstream			Vesuvius Group		Downstream	
Tier 2 suppliers	Other suppliers	Materials suppliers	Operational processes	Support processes	Commercial and on-site processes	Customers
<ul style="list-style-type: none"> – Mined raw materials (Magnesia, alumina, silicon carbide etc.) 	<ul style="list-style-type: none"> – Capital equipment – Professional services – Maintenance services – Energy (natural gas and LNG, electricity, vehicle fuels) – Water – Toll manufacturing – Forwarders 	<ul style="list-style-type: none"> – Processed materials (transforming mined raw materials, so they are ready to use in our processes) – Chemical compounds – Auxiliary components – Packaging materials – Traders 	<ul style="list-style-type: none"> – Manufacturing – Marketing & Technology – Systems engineering – R&D – Procurement – Health and safety – Quality – Warehousing 	<ul style="list-style-type: none"> – Management – Human Resources – Accounting – Controlling – Internal Audit – Legal services – Communication – Investor Relations – IT 	<ul style="list-style-type: none"> – Account management – Application engineering – Outsourced maintenance services – Project services 	<ul style="list-style-type: none"> – Steel plants – Foundries – Glass plants – Other industrial customers
Upstream logistics				Downstream logistics		
<ul style="list-style-type: none"> – Logistics of deliveries of materials from suppliers to the Vesuvius Group – Intercompany logistics 				<ul style="list-style-type: none"> – Logistics of deliveries of finished goods to Vesuvius warehouses – Logistics of deliveries of finished goods to customers 		

Our stakeholders

Given the diversity of the Group, engagement with most stakeholders takes place locally or is managed by specialist Group functions.

The Board maintains oversight of this engagement through its briefings on the dynamics of key relationships and stakeholder groups, and also engages directly as appropriate.

The Group's key stakeholder groups, reflecting those who have the biggest impact on the business, and our modes of engagement are outlined in the tables below.

Our people

Why we engage

- With our decentralised management model, the dedication and professionalism of our people, their capacity to own their roles and their drive for results are the most significant contributors to Vesuvius' success
- We engage with our people, encouraging and rewarding high performance to create an environment where all can realise their individual potential

Issues that matter to them

- Health and safety
- Development and retention
- Career opportunities
- Remuneration and recognition
- Diversity and inclusion
- Management support
- International mobility
- Sustainability performance

How the business engages

- Fundamental focus on health and safety and the care of all employees, with regular safety briefings, safety training, the thorough investigation of all safety incidents, daily focus on safety improvements and awards recognising excellent performance
- Continuing dialogue between employees and their managers, including the conduct of regular performance reviews
- We operate a competitive remuneration and benefits strategy, emphasising talent development with tailored career-stage programmes
- Living the Values and other award schemes celebrate individual achievements in the demonstration of our Values and processes
- We operate global communication mechanisms including an intranet and global email communications, alongside forums such as local 'town hall' meetings
- The Group recognises trade unions and operates local works councils, alongside its European Works Council
- Wide-ranging internal training is offered on key job-related issues, with programmes such as the Vesuvius University – HeaTt

How the Board engaged in 2024

- At every Board meeting the Board received a report on the Group's performance against health and safety KPIs and reviewed, in detail, the circumstances of any Lost Time Injuries that had been reported
- The Board reviewed the Group's strategy to attract talent to the business and reviewed the HR objectives for each Business Unit
- The Remuneration Committee was informed of global salary budgets and oversaw the Group's share compensation programmes
- The Nomination Committee reviewed senior management development and succession planning, and monitored the Group's progress on diversity objectives
- Carla Bailo served as the designated Non-executive Director responsible for workforce engagement. She oversaw the Board's engagement activities, including the programme of 21 site visits undertaken by Directors to meet Vesuvius employees 'on the ground' and to hear firsthand about their experiences
- The Board reviewed the results of the I-Engage survey and the follow-up actions proposed
- The Board reviewed the nature and volume of reports received by the confidential Speak Up helpline

Outcomes

- Safe, motivated workforce
- More attractive recruitment marketing to new recruits
- Greater understanding of views of the workforce

17%

employee turnover in 2024

92%

response rate to I-Engage survey

Our stakeholders

Our customers

Why we engage

- Engaging with, and listening to, our customers helps us to understand their needs and identify opportunities and challenges. Customer intimacy lies at the heart of our business model and collaborating with them enables us to deliver value using our expertise to improve the safety and efficiency of their manufacturing processes, enhancing their end-product quality and reducing their costs

Issues that matter to them

- Health and safety
- Product quality and performance
- Value generation
- Innovation and provision of solutions
- Production efficiency
- Environmental performance

How the business engages

- Our business model focuses on collaboration with customers to provide customised solutions. We employ highly skilled technical experts who understand our customers' needs, and can identify opportunities and solutions for them
- We work with customers to improve the safety, energy efficiency, yield and reliability of their processes, and the quality of their products
- We engage with customers on safety leadership and support their training requirements
- We maintain senior-level dialogue with all key customers, and establish customer relationships on a global basis as required, complemented by a broad local servicing capability
- We provide technical customer training and participate in industry forums and events

How the Board engaged in 2024

- The Chief Executive maintained a regular dialogue with a range of the Group's key customers, holding face-to-face meetings with 12 of them
- The full Board visited a key customer in China, as part of its off-site Board meeting
- The Board received briefings on the Group's end-markets and the dynamics of the Group's relationships with its customers, including information on pricing discussions
- At every Board meeting, the Board reviewed information on the Group's performance against key manufacturing quality targets and was provided with updates on actions undertaken to rectify any significant quality issues or customer complaints
- The Board received updates on the steps being taken by the Group to respond to customers' ongoing requirements, and the research and development, marketing and new product launch strategies being actioned to respond to these

Outcomes

- Clear understanding of customers' challenges and requirements
- Collaborative customer relationships
- Investment in enhancement of existing products and development of new innovative products to support customers' needs
- Customer considerations are a key input into strategic planning
- Engagement on sustainability matters



Our stakeholders

Suppliers and contractors

Why we engage

- Maintaining a flexible workforce through the use of contractors and cost-effective access to high-quality raw materials is vital to our success. Our suppliers and contractors are critical to our business

Issues that matter to them

- Operational performance
- Responsible procurement
- Trust and ethics
- Payment practices

How the business engages

- We employ a significant number of directly supervised contractors to work at our customer locations
- We conduct regular visits to key suppliers
- Senior-level relationships are built with all large suppliers
- All suppliers/brokers for major raw materials have regular interaction with the Global Purchasing team
- Dedicated category directors build long-term relationships and product expertise for key raw materials
- Our purchasing and supplier-facing staff receive training on modern slavery to assist them in identifying any issues
- Vesuvius operates a Sustainable Procurement Policy which sets out the standards that suppliers must adopt in order to supply the Group. We conduct a rigorous and consistent supplier accreditation procedure to ensure compliance with these standards

How the Board engaged in 2024

- The Chief Executive met with a number of key suppliers
- The Board received a briefing on the Group's suppliers and regular updates on supply and purchasing dynamics, and pricing
- The Board received updates on the strategy for logistics and the sourcing of raw materials together with key concerns and performance issues
- The Board monitored the Group's compliance activities and approved the Group's annual Modern Slavery Statement

Outcomes

- We have a good understanding of the capability and capacity of key suppliers
- Suppliers have a clear understanding of Vesuvius' expectations as an ethical business
- Broader supply chain
- Engagement on sustainability matters

2,500

directly supervised contractors were utilised in 2024

269

suppliers have been rated under our Supplier Sustainability Assessment programme

305

suppliers have pledged to comply with our Sustainable Procurement Policy



Our stakeholders

Investors

Why we engage

- The support of our equity and debt investors, and continued access to funding, is vital to the performance of our business. We work to ensure that our investors and lenders have a clear understanding of our strategy, performance and objectives, recognising that supportive investors are more likely to provide the Company with funds for expansion. We engage with lenders to ensure that we have clear knowledge and awareness of market sensitivities and trends, and comply with our contractual obligations

Issues that matter to them

- Shareholder value
- Financial and operational performance
- Strategy and business development
- Dividend and gearing policy
- Sustainability strategy and performance
- Governance
- Transparency and ethical behaviour

How the business engages

- Our Head of Investor Relations, Chief Financial Officer and Chief Executive hold regular meetings with key and prospective investors
- The Group Treasurer and CFO hold regular meetings with key personnel from banks and other lenders who provide the Group's debt funding
- The Group Treasury function maintains an ongoing dialogue with key relationship banks and other local banks in the countries in which Vesuvius operates
- The Group's Annual Report provides an overview of the Group's activities. Regular announcements and press releases are published to provide updates on the Group's performance and progress
- There is ongoing dialogue with the Company's analysts to address enquiries and promote the business

How the Board engaged in 2024

- The Chief Executive and Chief Financial Officer held meetings with key and prospective investors
- The Board approved the terms of the Group's revolving debt refinancing
- The Board discussed with its advisers, shareholders' perspectives on the Group's strategy and received presentations on market dynamics and value drivers
- The Board received copies of key analysts' notes issued on the Company
- The Chairman met with shareholders and potential new investors, and discussed the Group's strategy
- Ahead of the 2024 AGM, the Chairman contacted the Group's largest shareholders and governance agencies, to invite them to discuss any matters they wished to raise
- The Directors attended the AGM to meet with shareholders

Outcomes

- Development of the Group's strategy
- Long-term shareholder base
- Solid support for the Group's revolving debt refinancing

£62.4m

returned through our share buyback programme

£61.1m

total dividends paid in 2024



Our stakeholders

Communities

Why we engage

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

Issues that matter to them

- Career opportunities
- Operational performance
- Transparency and ethical behaviour
- Environmental performance

How the business engages

- We provide work experience and internships to local university students and school children
- We maintain contact with universities to identify local talent and our businesses attend careers fairs and provide student work placements and internships
- Many of our sites sponsor local charitable activities and participate in local volunteering initiatives
- We maintain clear oversight and control of the environmental impact of our production sites
- We have a clear strategy for carbon reduction in our manufacturing processes

How the Board engaged in 2024

- The Board received biannual updates on the Group's sustainability activities

Outcomes

- Development of future talent
- Positive contribution to local communities and charities
- Improved environmental sustainability of the Group's operations

Environmental agencies and organisations

Why we engage

- Good environmental management is aligned with our focus on cost optimisation, operational excellence and long-term business sustainability. We engage with appropriate organisations to ensure that we are complying with regulatory requirements, and to publicise our performance

Issues that matter to them

- Governance and transparency
- Operational performance
- Reporting on performance metrics
- Environmental performance

How the business engages

- Vesuvius is a signatory to the UN Global Compact
- We publish a full Sustainability Report online which can be accessed via Vesuvius' website
- We regularly engage with government agencies who visit our sites and carry out inspections
- We respond to environmental research as part of our customers' and suppliers' due diligence processes
- We engage with rating agencies and respond to environmental and social responsibility research and questionnaires

How the Board engaged in 2024








- The Board monitored progress on the Group's sustainability KPIs and reviewed longer-term plans on sustainability initiatives, including the journey to net zero
- The Board received biannual presentations from the VP Sustainability on the Group's progress against its sustainability targets and updates on its ESG ratings
- The Board and Audit Committee monitored the Group's progress with its Task Force on Climate-related Financial Disclosures (TCFD) compliance

Outcomes

- Positive ratings by a range of ESG organisations
- Sustainable business operations
- Supportive relationships with local government agencies

Our sustainability journey

Evolution of our MSCI, CDP and EcoVadis ratings reflects the progress made in the deployment of our sustainability strategy and disclosure.

	2020	2021	2022	2023	2024
	<ul style="list-style-type: none"> – Sustainability Charter – Sustainability Council – Vesuvius adheres to the UN Global Compact – Internal price of carbon – Supplier assessment programme 	<ul style="list-style-type: none"> – Scope 1 and Scope 2 emissions externally verified – Scope 3 emissions evaluated – Sustainable Procurement Policy – Sustainability scorecard – First Sustainability Report – Task Force on Climate-related Financial Disclosures (TCFD) 	<ul style="list-style-type: none"> – Roadmap to net zero – First CDP questionnaire – Sustainability Report Global Reporting Initiative (GRI) aligned 	<ul style="list-style-type: none"> – Launch of Scope 3 data collection (raw material suppliers, upstream and downstream transportation) – Launch of Product Carbon Footprint project – Commencement of double impact materiality assessment 	<ul style="list-style-type: none"> – TCFD and Double Materiality Assessment review – CSRD/European Sustainability Reporting Standard (ESRS) gap analysis – Defined Key Performance Indicators (KPIs) for 2025–2030
MSCI 	BBB	A	AA	AA	AA
ecovadis					
CDP 			B	A-	B

Progress on our sustainability targets

The Board has identified nine significant non-financial KPIs for the business, aligned with the Group's main sustainability objectives (they cover 100% of our operations, owned and joint ventures). These KPIs were defined when the sustainability strategy was launched in 2020. Most targets associated with the KPIs have a deadline in 2025. Focus on these KPIs has been maintained in the following years. We have set stretching targets for the Group's sustainability KPIs to reach within set time frames. These are set out in the table below. In view of the progress made, the reduction of Scope 1 and Scope 2 CO₂e emissions target was increased in 2022 from 10% to 20% and its coverage increased from Energy CO₂e to all CO₂e emissions. In 2024, we selected the main KPIs to be tracked until 2030. In 2025, we will set the targets for these new KPIs.

KPI	Measure	Target	2024 progress vs plan ¹	2024 progress	Main domain	UN Sustainable Development Goals
Safety	Lost Time Injury Frequency Rate	<1	 Ahead of schedule	0.52	 Our people	 
Energy intensity	By 2025, reduce energy intensity per metric tonne of product packed for shipment (vs 2019)	-10%	 Ahead of schedule	-10.1% ^{1,2,3}	 Our planet	 
CO ₂ e emission intensity	By 2025, reduce Scope 1 and Scope 2 CO ₂ e emission intensity per metric tonne of product packed for shipment (vs 2019)	-20%	 Ahead of schedule	-26.9% ^{1,2,3}	 Our planet	  
Wastewater	By 2025, reduce wastewater per metric tonne of product packed for shipment (vs 2019)	-25%	 On plan	-28.0% ^{1,2,3}	 Our planet	  
Solid waste	By 2025, reduce solid waste (hazardous and sent to landfill) per metric tonne of product packed for shipment (vs 2019)	-25%	 Behind plan	-21.7% ^{1,2,3}	 Our planet	 
Recycled material	By 2025, increase the proportion of recycled materials from external sources used in production	7%	 Behind plan	6.0% ^{1,2,3}	 Our customers	 
Gender diversity	By 2025, increase female representation in the Senior Leadership Group (approx. 150 top managers)	25%	 Behind plan	21%	 Our people	
Compliance training	Increase the percentage of targeted staff who complete anti-bribery and corruption training annually	90%	 Ahead of schedule	100%	 Our communities	
Supply chain	By the end of 2023, conduct sustainability assessments of our raw materials suppliers (as a percentage of Group raw material spend)	50%	 Target achieved	58%	 Our communities	 

During 2023, our production of dolime was considerably reduced, following an incident in January which incapacitated one of our rotary kilns. The dolime installation resumed production in 2024 albeit at a lower level than prior to the 2023 incident. As dolime production is a major contributor to the Group's tonnage and CO₂ emissions, the change in product mix skews environmental performance comparisons both with prior years and with the 2025 target. The table above therefore contains pro forma performance figures as if the dolime process had been operating normally to preserve meaningful comparability. The actual figures are set out in a footnote to the table.

1. Re-baselined using pre-acquisition data for the business acquired from Universal Refractories, Inc. (Vesuvius Penn Corporation), and BMC (Yingkou YingWei Magnesium Co., Ltd).

2. Pro forma: performance as if the dolime process had been operating normally in 2023 and 2024.

3. Actual Group performance for 2024, with actual dolime production: Energy intensity -14.0%, CO₂e emission intensity -40.4%, Wastewater -24.6%, Solid waste -18.0%, Recycled material 6.5%.

Our priorities

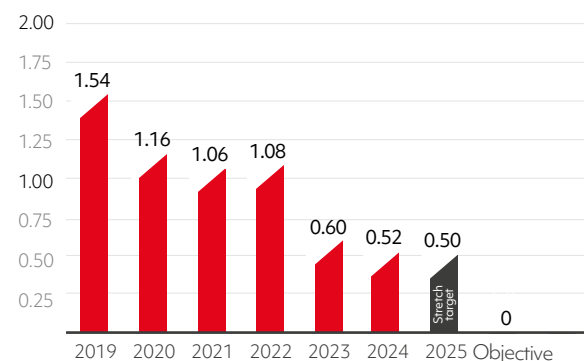
Become a zero-accident company

The number one priority at Vesuvius is to provide our employees with a safe place to work.

We were pleased to see continued progress with the reduction of our Lost Time Injury Frequency Rate (LTIFR) in 2024, recording a rate of 0.52 per million hours worked, which was 13% lower than 2023 (0.6).



Group safety performance Lost Time Injury Frequency Rate



Notes:
The numbers are collated from 100% of entities within the Group's Operational Control Boundary.

Looking forward

We are determined to continue our journey to zero accidents. Learning from past incidents, we will continue focusing on two pillars:

People development and behaviours

- Training and auditing
- Core Safety Rules
- Safety days

Equipment and activities

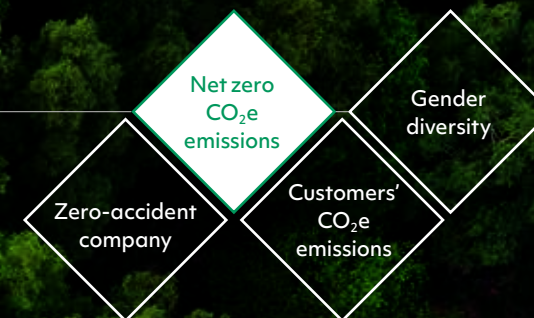
- Lifting and handling
- Machine guarding and safe procedures
- Process safety

Learn more P91

Our priorities

Reach net zero CO₂e emissions by 2050 (Scope 1 and Scope 2)

We have made considerable progress in energy conservation, with our conservation plan now in its third cycle of improvement.

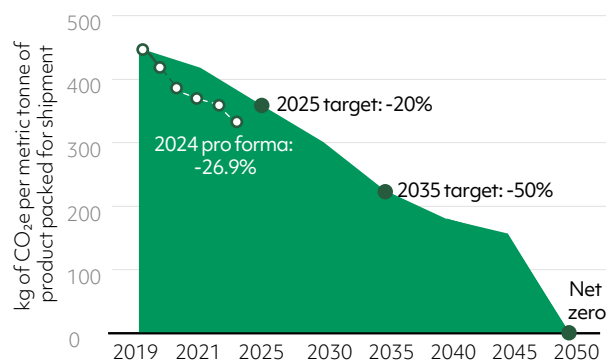


In 2024, we continued to focus on further improvements, including:

- Modernising and upgrading installed equipment to reduce our energy consumption
- Investing to renew equipment to the best available technologies and converting to less CO₂ intensive energy sources
- Generating clean energy
- When possible, replacing high CO₂e emission electricity with greener electricity or other sources of energy
- Reducing our energy wastage, recovering heat to feed processes and heat water

Between 2019 and 2024, our overall CO₂e emission intensity metric (CO₂e emissions per metric tonne of product packed for shipment, Scope 1 and Scope 2, market-based) reduced by 26.9%¹, versus a target of 20% by 2025 Pro forma.

Target emission intensity (Scope 1 and Scope 2)



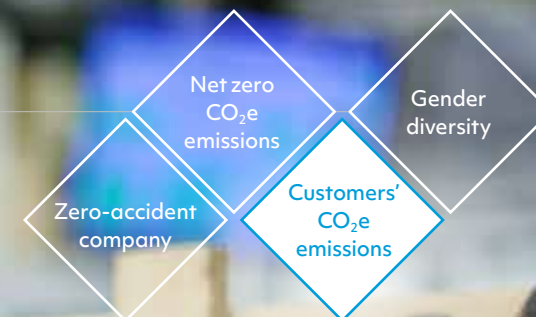
1. Pro forma performance calculated as if dolime production had been operating normally in 2023 and 2024. The actual reduction in Scope 1 and 2 CO₂e emission intensity in 2023 was 45.9% and in 2024 was 40.4%.

Our priorities

Help our customers reduce their CO₂ emissions

According to estimates from the World Steel Association (WSA), the steel industry generates between 7% and 9% of global direct emissions from the use of fossil fuels.

We help our customers improve their casting operations' performance, thereby increasing the energy efficiency of their entire process.



In 2024, 67% of ongoing new product development projects were dedicated to market-leading sustainable products.

Areas of expertise:

- Materials science
- Application engineering
- Digital solutions
- Mechatronics

Benefits for customers:

- Reduce exposure to hot metal
- Reduce CO₂ emissions per tonne of steel produced
- Reduce consumption of refractory material per tonne of steel
- Improve metal yield (tonne of finished product per tonne of molten metal) and quality
- Reduce weight of metal parts in vehicles

Learn more P68 >

Our priorities

Improve gender diversity at every level of the Company

Vesuvius recognises the value of a diverse and skilled workforce. We operate in 40 countries, employing people from over 70 nationalities.

Women now represent 21% of our Top 150 senior managers (Senior Leadership Group; 2023: 20%) which is a level that we consider is still too low and still below our 2025 target of 25%, but which represents a significant improvement as compared with the level of 15% in 2019.



% of women	2024	2025 ambition
Board and Group Executive Committee	35%	
Senior Leadership Group	21%	25%
Workforce	13%	

We remain far from our ambition to reach 25% by the end of 2025. We see this as a challenging target given the relatively low attractiveness of our industry to female entrants. To meet this challenge, we are placing greater emphasis on developing an internal pipeline of female talent. We are also seeking to improve gender diversity throughout the organisation, and we encourage managers throughout our business to leverage our decentralised entrepreneurial culture to drive programmes suited to local needs.

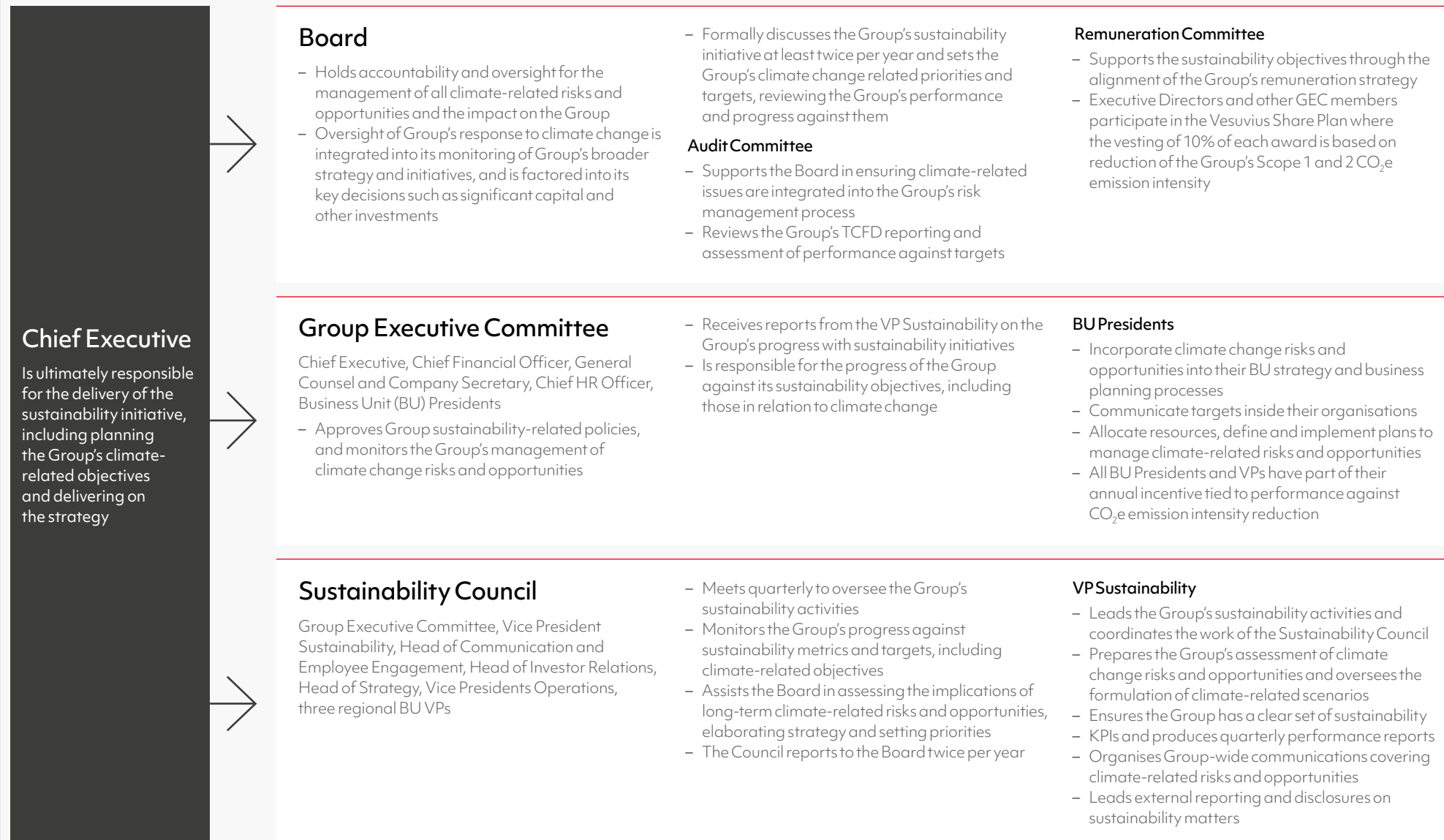
Vesuvius companies have implemented various programmes and initiatives which address the following:

- Flexible working arrangements
- Supporting the education of women and girls in STEM
- Equality ambassadors and training programme

Learn more P106

Our sustainability governance

In 2024, the governance structure for the oversight of sustainability and climate change matters, and their associated areas of focus, remained the same as in previous years.



Sustainability impacts, risks and opportunities management

Integration with Group risk management and overall management processes

The sustainability impact, risks, and opportunities management is a component of the Group's risk management and overall management processes.

Each year the Group undertakes a robust assessment of the principal and emerging risks which could have a material impact on the Group; this assessment covers all of Vesuvius' operations. A number of sustainability risks are recorded in this analysis (see the Risk, viability and going concern section on pages 67–73 of our Annual Report).

The Group maintains and continuously updates its sustainability Double Materiality Assessment, an analysis of 90 impacts, risks and opportunities, based on the ESRS classification. The outcomes of our sustainability Double Materiality Assessment identify and prioritise issues, and feed into the Group's review of principal and emerging risks. They also inform the Business Units and Group into their strategic plans and budgets, which are presented every year to the Board.

In line with the recommendations of TCFD, Vesuvius also undertakes a review of the key climate-related opportunities and risks that we foresee impacting the Group over the short, medium and long term.

The Board has considered the significance of climate-related risks in relation to risks identified in the standard risk management process. Climate-related risks are reviewed every six months by the GEC, and subsequently by the Board, as part of the Group's standard risk management process, to ensure the register reflects any material changes in the operating environment and business strategy, and to ensure that the management of climate-related risks is integrated into our overall principal risk management framework.

The Business Units factor climate change risks and opportunities into their business planning processes, assessing the long-term impacts on profitability of both the risks and opportunities.



What matters to Vesuvius

Double Materiality Assessment outcome

The boundary between material topics and other strategic topics was defined considering the magnitude of the potential impacts, and their irreversibility or long-term effects before mitigation actions or control measures. Material topics could result in impacts of far greater magnitude and with much longer lasting effects (either on society and the environment or on Vesuvius business performance) than the other strategic topics.

Five topics stand out according to these criteria and were therefore retained as material:

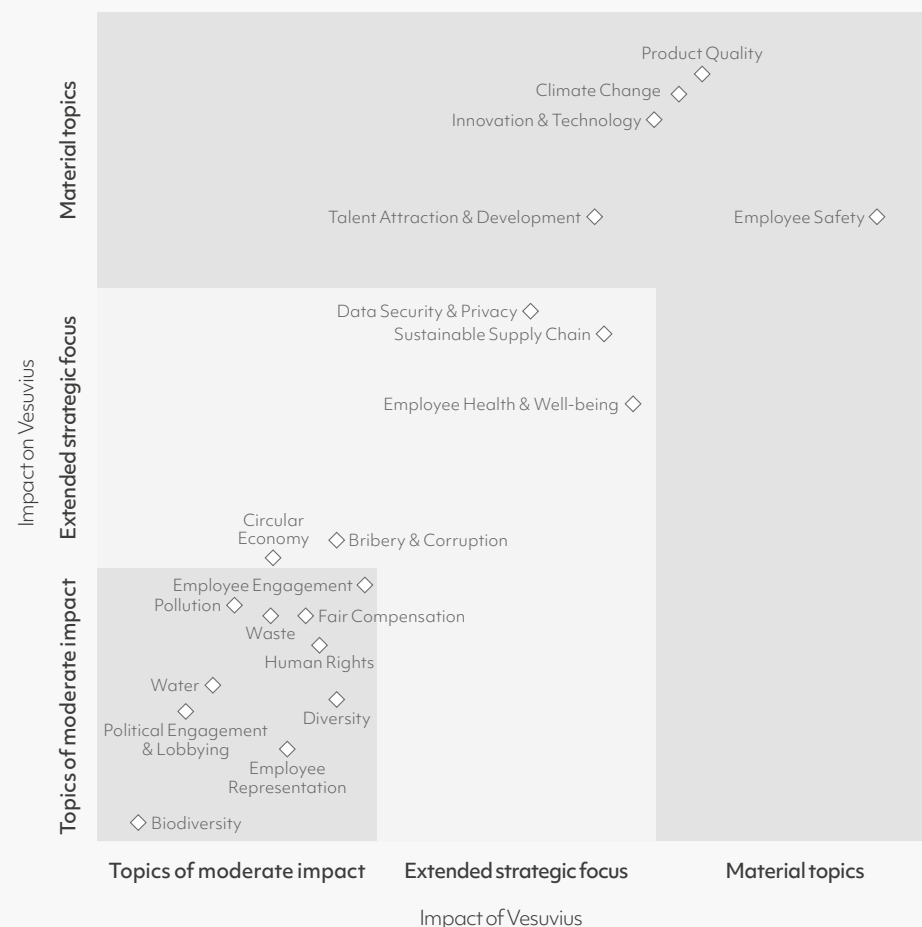
- Product quality
- Climate change (E1)
- Innovation and technology
- Employee safety (S1)
- Talent attraction and development (S1)

The potential recurring long-term impact of the following five topics was assessed to be significantly lower. They were therefore included in our extended strategic focus but not considered as material. As such they are not subject to formal reporting requirements under ESRS rules:

- Data security and privacy (S1)
- Sustainable supply chain (S2)
- Employee health and well-being (S1)
- Bribery and corruption (G1)
- Circular economy (E5)

For more details on our materiality assessment process, see P128–136.

Materiality matrix





OUR PLANET

Vesuvius recognises the urgency of tackling climate change, the finite nature of most natural resources and the obligation we have to preserve the environment for future generations.

Environmental Policy	31	➤
Tackling climate change	32	➤
Our roadmap to net zero	44	➤
Using fewer resources	55	➤



Environmental Policy

Vesuvius policies

Vesuvius has developed and deployed an Environmental Policy, which is aligned with the outcome of our impacts, risks and opportunities assessments, and covers our material topics. This policy summarises our beliefs, organisation and responsibilities, commitments and actions, especially in terms of the direct and indirect fight against climate change and the circular economy (minimising greenhouse gas emissions, reducing waste, increasing the usage of recycled materials).

Environmental Policy

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 proactive in preventing negative effects to the environment and will continuously improve our environmental management systems and performance.

Organisation and responsibilities

- We regard all environmental matters – including climate change – 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 commitments

- Minimise direct and indirect CO₂ and other greenhouse gas emissions, by reducing the energy intensity of our business and using cleaner energy sources
- Reduce waste at source and during production
- Minimise any pollution or releases of substances which could adversely affect humans or the environment
- Increase the usage of recycled materials and promote the development of the circular economy
- Avoid negative impacts on biodiversity
- Minimise the consumption of water and other resources

Our actions

- We will raise environmental issues at all levels, openly consult with stakeholders to address them and report regularly on them
- We will set targets and implement action plans to improve our environmental performance
- We will provide training to all employees and contractors to ensure that they understand their responsibilities and are able to act accordingly
- We will build environmental protection into our products and processes
- All our investment decisions will include an analysis of their environmental impact. An internal price for CO₂ emissions will be included for the calculation of payback for all investments reaching the threshold for approval by the BU Presidents or Chief Executive
- Every business facility will have an appointed Environmental Manager
- 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
- Every manufacturing site will implement an environmental management system that is aligned with ISO 14001

Tackling climate change

We are committed to reducing our environmental footprint by reaching net zero greenhouse gas emissions (Scope 1 and Scope 2) by 2050 at the latest and helping our customers reduce their emissions through improvements in the efficiency of their operations.

Reducing our impact

Vesuvius actively participates in measures to tackle climate change by working to reduce the CO₂e emissions of all of our operations and the quantity of raw materials used, alongside helping our customers to reduce their own CO₂ footprint through the use of our products and services. Vesuvius also embraces society's expectations for greater transparency around environmental reporting.

Supporting our customers

According to estimates from the WSA, the steel industry generates between 7% and 9% of global direct emissions from the use of fossil fuels, and it estimates that on average 1.91 metric tonnes of CO₂ are emitted for every tonne of steel produced.

The iron and steel industries are taking action to address the decarbonisation challenge, and we are supporting them, working in partnership with them to develop more sustainable solutions.

With around 10 kg of refractory material required per tonne of steel produced, the careful selection and use of energy-saving refractories can beneficially impact the net emission of CO₂ in the steel manufacturing process. In the foundry process, the amount of metal melted versus the amount sold as finished castings is the critical factor impacting a foundry's environmental efficiency. Vesuvius continuously works with its customers to increase this metal yield.

Supporting policy development

Vesuvius supports the Paris Agreement's central aim, to strengthen the global response to the threat of climate change by keeping a global temperature rise this century well below 2°C above pre-industrial levels, and pursuing efforts to limit the temperature increase even further to 1.5°C, via the implementation of its roadmap to net zero.

As the world transitions to a low-carbon global economy, Vesuvius supports the call for policymakers to:

- Build a level global playing field, including carbon border adjustment mechanisms, and robust and predictable carbon pricing for companies. This will strengthen incentives to invest in sustainable technologies and to change behaviours
- Develop the necessary energy production and distribution infrastructure to provide access to abundant and affordable clean energy



Tackling climate change

Climate change related risks and opportunities

The actions being taken by governments and societies around the world to mitigate climate change, and the changes in temperature and weather patterns resulting from it, present both opportunities and risks to Vesuvius. In its broadest context, we believe that the need for climate change initiatives will create ever greater opportunities for the Group to support our customers – to improve their efficiency and reduce their environmental impact.

The fight against climate change continues to require higher-technology steel and larger, more complex castings. Wind and solar energy production capacity are both considerably more steel-intensive than fossil fuel power stations, and these are both set to grow considerably. Allied to this, the steel-making process is itself decarbonising thanks to efforts to improve the performance of existing assets, and the shift from blast furnaces to direct reduced iron and electric arc furnaces.

Our products are useful for low-carbon applications as well as the more traditional ones. No alternative to iron and steel, with the ability to offer the same range of properties and applications at comparable scales and costs, is envisaged in the foreseeable future. The technology transition required to decarbonise the iron and steel industry will not render our products obsolete. More than 70% of our revenue in steel is generated at the ladle and caster stages of the steel-making process, which will be unaffected by the changes. Other steps of the iron and steel-making process will continue to require refractory materials.

Our assessment of climate change-related risks and opportunities covers 100% of Vesuvius' operations.

>70%

of our revenue in steel is generated at the ladle and caster stages of the steel-making process



Tackling climate change

Physical risks and business continuity

Thanks to significant restructuring carried out over the past seven years, Vesuvius now operates in a resilient and optimised global footprint. None of our manufacturing sites contribute directly or indirectly to more than 10% of our revenue and a significant amount of redundancy for most product lines remains, providing backup in case of local disruption and ensuring continuity of supply for our customers.

Vesuvius operates in 54 manufacturing sites and six R&D centres of excellence located in 23 countries. From time to time our operations can be subject to physical damage driven by weather events, such as severe storms and flooding, water shortages or wildfires, whose frequency

and intensity may be exacerbated by climate change. Such events may also impact the manufacturing capabilities of our customers and suppliers, and impact our supply chain logistics.

Sites are routinely audited by our insurers and our external risk specialist. Their reports are combined with water stress analyses (based on the Aqueduct water risk atlas) and our history of events to create a physical and weather event risks map, indicating our manufacturing and R&D sites' susceptibility to physical risks arising from climate change.

In 2024, we continued updating our risk map based on professional risk engineering surveys.



◆ R&D centres of excellence

32 sites were identified as being high-risk for at least one type of weather event (flooding, hailstorm, lightning, storms, tornadoes and wildfires), and four are located in areas of very high water stress (and 16 in areas of high water stress). None of our sites were markedly affected by any major weather event in 2024 (no disruption to customers and no insurance claims made).

We anticipate that the likelihood and severity of adverse weather events will continue to increase, and we therefore manage our business to prepare for them and mitigate their impact when they do occur.

Local and product line business continuity plans are maintained by our manufacturing sites and are regularly reviewed. Vesuvius sites maintain and exercise emergency plans to deal with such events as part of their normal risk management and business continuity processes. 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.



Tackling climate change

Sites with the highest exposure to earthquakes, water stress or weather events

Country	Site	Water stress (high and very high)	Flood – water bodies	Flood – precipitation	Hailstorm	Lightning	Wind – tropical storms	Wind – extra tropical storms	Tornado	Wildfire	Earthquake
Australia	Port Kembla					●				●	
Belgium	Ostend							●			
Brazil	Piedade				●	●					
	Resende		●	●		●					
	Rio de Janeiro	●				●					
	São Paulo	●			●	●					
China	Anshan	●									
	Bayuquan	●									
	Changshu		●								
	Suzhou	●									
	Weiting	●									
	Wuhan				●						
	Yingkou BRC	●		●							
Czech Republic	Trinec		●								
India	Kolkata	●	●	●			●				
	Mehsana	●									
	Puducherry	●									
	Pune	●									
	Vizag	●					●				
Indonesia	Jakarta Timur	●	●			●	●				●
Italy	Muggio				●						
Japan	Toyokawa						●	●			●
Malaysia	Pelubhan Klang		●	●		●	●				

Transition risks

We believe that the main climate change transition risks facing the Group relate to:

1. The potential for carbon taxing or emissions rights trading schemes to be introduced or increased, in Europe and the US, but not uniformly in other regions, without effective border adjustment mechanisms to accompany them. An increase in the cost of carbon emissions would affect our manufacturing costs. We are addressing this through our energy efficiency improvement initiatives and conversion to non-fossil fuels wherever possible. Long-lasting energy price increases and significant differences between Europe and other regions would further exacerbate this risk, affecting our customers' manufacturing footprint and our own.
2. The rapid transition from iron to aluminium for light vehicle castings. A very rapid transition from iron to aluminium for light vehicle castings would affect our revenue in the iron castings market. We expect this to be compensated for by increased sales for aluminium castings, growing sales of products for thin-section automotive component iron castings and turbo-charger castings for hybrid vehicles.

Tackling climate change

Sites with the highest exposure to earthquakes, water stress or weather events continued

Country	Site	Water stress (high and very high)	Flood – water bodies	Flood – precipitation	Hailstorm	Lightning	Wind – tropical storms	Wind – extra tropical storms	Tornado	Wildfire	Earthquake
Mexico	Monterrey	●									
	Ramos Arizpe	●	●								
Netherlands	Hengelo		●								
Poland	Skawina		●								
South Africa	Johannesburg		●		●	●					
	Olifantsfontein	●			●	●					
Taiwan	Ping Tung					●	●				
Türkiye	Gebze										●
	Istanbul	●									
UAE	Ras Al Khaimah	●		●							
UK	Tamworth		●								
USA	Champaign					●			●		
	Charleston								●		
	Chicago Heights					●			●		
	Conneaut		●			●			●		
	Coraopolis		●			●					
	Graham					●					
	Wampum		●			●					
	Wurtland					●					

Highest exposure to weather events and earthquakes based on risk evaluations conducted as part of our insurance programme; water stress based on Aqueduct water risk atlas.

Tackling climate change

Climate-related risks and opportunities analysis

The choice of short-, medium- and long-term horizons for the analysis of key climate-related impacts, risks and opportunities is driven by projected customer footprint evolutions and investment cycles, the speed of deployment of emerging technologies, the duration of product development cycles, policy and regulatory evolutions, and capital equipment lifetime (often two decades or more).

Short term (2026): The short term is defined as one to two years. It is aligned with our strategic plans. Within this time frame, regulatory and policy changes will have very limited impact on the Group's climate-related risks and opportunities. This is also the typical time frame required for major capital expenditure decision-making and implementation.

Medium term (2035): This is the most likely horizon for policies and regulatory frameworks (such as the EU Emissions Trading System and Carbon Border Adjustment Mechanism) currently being defined in many regions to reach their full effect. The effects of technological innovation currently in the later development stages will become effective and their deployment will begin during this period. We anticipate that the major adjustments to customers' footprints and technology investments will be in full swing by then.

Long term (2050): This deadline has been retained by the UN and many policymaking bodies to set decarbonisation goals. We are committed to reaching net zero (Scope 1 and 2) by 2050 at the latest.

The opportunities we have identified are integrated into the Group's business strategy and are being pursued by the relevant Business Units.

Impact categories (trading profit)

We have assessed our risks and opportunities, and sorted them according to the following classification:

Very high (>£25m)		High (£10–15m)		Minor (£1–5m)	
Major (£15–25m)		Moderate (£5–10m)		Insignificant (£0–1m)	

Opportunities

			Potential annual impact on trading profit in the short, medium and long term		
Opportunity	Description	Impact	Short term 2026	Medium term 2035	Long term 2050
Products and services					
Ability to diversify business activities	Commercialise refractory solutions for low-CO ₂ emitting processes in the production of aluminium to replace carbon-based products	Increased revenue and trading profit	Insignificant	Minor	Minor to high
	Commercialise refractory solutions for hydrogen-based Direct Reduction Iron production and steel to replace traditional refractory products		Insignificant	Insignificant to minor	Insignificant to high
Markets					
Access to new markets	Accelerated growth of the wind power market leading to increased sales to foundries serving this market	Increased revenue and trading profit	Minor	Minor	Minor to high
	Accelerated growth of the aluminium castings market for light electric vehicles and light-weighting leading to increased sales to foundries serving this market		Minor	Minor	Minor to high
	Accelerated growth of ferrous castings for hybrid vehicles (turbo-chargers) and thin-section castings for internal combustion engines leading to increased sales to foundries serving this market		Insignificant to minor	Insignificant to minor	Insignificant
	Accelerated growth of the high-technology steel segment		Insignificant to minor	Minor to high	Moderate to very high

Tackling climate change

Impact categories (trading profit)

We have assessed our risks and opportunities, and sorted them according to the following classification, which used the same thresholds as for the assessment of principal risks:

Very high (>£25m)



High (£10–15m)



Minor (£1–5m)



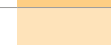
Major (£15–25m)



Moderate (£5–10m)



Insignificant (£0–1m)



Risks

				Potential annual impact on trading profit in the short, medium and long term		
Risks	Description	Impact	Mitigating actions being undertaken	Short term 2026	Medium term 2035	Long term 2050
Physical risks						
Increased frequency and severity of extreme weather events (heatwaves, rain and river flooding, cyclones, snow etc.)	Physical damage to Vesuvius locations and people Business disruption due to natural disasters	Increased cost due to physical damage Reduced revenue from business interruption	Mitigating actions for severe weather events and the associated risks are included in the business continuity plans of plants, and insurance is purchased	Minor	Minor	Minor
Transition risks – Policy and legal						
Carbon taxing/emissions rights trading/border adjustment mechanisms introduced or extended	Increase in manufacturing costs	Increased operating costs (main risk in Europe)	CapEx to improve energy efficiency and conversion to non-fossil fuels to eliminate CO ₂ emissions. Relocation of manufacturing to reflect movements in customer base	Insignificant	Insignificant to minor	Insignificant to moderate
Transition risks – Market						
Rapid growth of aluminium casting processes for light vehicle castings at the expense of traditional ferrous and other non-ferrous processes (due to conversion to electric vehicles)	Shift from castings using a high level of consumables to low consumable processes creates risk of revenue loss for the Foundry Division	Reduced revenue from shrinking market as some traditional castings will disappear or be converted to alternative processes	In ferrous, push to develop sales of Feedex and coatings for thin-section automotive components, and products for turbo-charger casting. Invest in R&D, marketing and sales force. In non-ferrous, develop products for HPDC and LPDC processes and increase penetration in markets with lower usage of refractories	Minor	Moderate to high	Moderate to high
Transition from internal combustion engines to electric vehicles will lead to the decline of sand and gravity castings	Reduced volume of aluminium power train components	Reduced revenue from shrinking market of consumables for sand and gravity castings	Adapt product portfolio, focusing on HPDC and LPDC	Insignificant to minor	Minor to moderate	Minor to moderate
Transition from Blast Furnaces – Basic Oxygen Furnaces converted to Direct Reduction Iron or Electric Arc Furnaces (EAF) for iron and steel-making	Share of EAF in total steel production increases	Reduced size of market where Vesuvius is strongest, leading to weaker positions in the steel market	Adjust R&D and product development priorities. Redeploy sales force, focusing on EAF market	Insignificant	Minor	Minor to moderate

Tackling climate change

Climate change scenario analysis

Vesuvius has undertaken scenario analysis to seek to quantify the likely impact of climate change on the business and to test the resilience of the Group's strategy to the changes that lie ahead.

We considered three scenarios, modelling the potential financial impact of 2°C, 3°C and 4°C temperature increases on our business.

Best case scenario

In formulating our scenarios, we took as our 'best case' a 2°C scenario. This was based on the premise that despite the tremendous acceleration of public awareness, regulation, technology development and capital allocation in recent years, we doubt that there is sufficient time for the 1.5°C target to be achieved. We therefore identified our most optimistic scenario as 2°C.

Our assumption is that any further acceleration which would allow the planet to get back onto a 1.5°C course would reinforce the main characteristics and accelerate the timeline of our 2°C scenario, without fundamentally changing its features.

From assumptions to strategy

The scenarios take as their starting point the regulatory and macroeconomic assumptions underpinned by the International Energy Agency's WEO 2020 Stated Policies Scenario and Sustainable Development Scenario.

Supplementing this, we have identified, for each scenario, the areas of our business in which changes may occur, such as:

- The evolution of end-markets
- Our customer footprint
- The pace and breadth of technology transition in iron and steel-making
- The pace of conversion from fossil fuels to clean electricity and hydrogen
- The evolution of the aluminium market

We then evaluated the potential magnitude of the risks and opportunities in each scenario, and analysed the implications for Vesuvius. We considered our strategic response in terms of:

- Our manufacturing and commercial footprint
- Our portfolio of products and services
- The conversion of our manufacturing processes to clean energy
- The prospects for our aluminium casting business

With this approach, the impacts on all key areas of the business were covered (sales, R&D, manufacturing and procurement).

The outcomes of the scenario analyses have been taken into account in formulating plans for achieving the Group's strategy.

Three long-term scenarios

4°C warming scenario

'Good intentions hampered by fear of economic war'

Incomplete policy and fiscal packages distort competition, slowing down technology development and leading to geographic shifts in steel supply

3°C warming scenario

'Closed doors'

Regional/national self-interest drives economic policy, competition wins over cooperation, regulatory framework and technologies evolve differently

2°C warming scenario

'Global accord'

High cooperation and commitment to limit emissions facilitates technology development and the transition to a low-carbon world



Tackling climate change

	4°C warming scenario 'Good intentions hampered by fear of economic war'	3°C warming scenario 'Closed doors'	2°C warming scenario 'Global accord'
1 Regulatory and macroeconomic environment	The EU and US implement carbon pricing mechanisms (taxation or cap on trade), but no Carbon Border Adjustment Mechanisms or Tariffs (or insufficient to prevent the transfer of manufacturing away from these regions)	The EU and US implement carbon pricing mechanisms (taxation or cap on trade), and Carbon Border Adjustment Mechanisms or Tariffs to protect their industries from delocalisation	All major economies implement carbon pricing mechanisms. The cost of CO ₂ increases in all regions at a comparable pace
2 Conversion of power generation from fossil fuels to clean electricity and hydrogen	<ul style="list-style-type: none"> Fast growth in Europe of non-CO₂ emitting electricity sources (nuclear and renewable) The cost of fossil fuels increases significantly in Europe Energy prices differ greatly between Europe and the rest of the world over a long period of time Coal reduces progressively, but does not disappear. Natural gas continues to grow outside Europe Hydrogen does not become available on a wide scale and economically competitive until well after 2040 	<ul style="list-style-type: none"> Fast growth of non-CO₂ emitting energy sources (nuclear and renewable) in Europe The cost of fossil fuels increases significantly in Europe. Coal reduces progressively, but does not disappear, natural gas continues to grow outside Europe Energy prices in Europe and the rest of the world realign progressively Hydrogen becomes available on a wide scale in the US and Europe, and economically competitive between 2030 and 2040 	<ul style="list-style-type: none"> Fast growth of non-CO₂ emitting energy sources (nuclear and renewable) in all regions The cost of fossil fuels increases significantly (taxation). Coal as a source of energy disappears, natural gas starts to reduce Energy prices in Europe and the rest of the world realign progressively Hydrogen becomes available on a wide scale and economically competitive between 2030 and 2040 Fast electrification of the automotive industry Fast growth of hydrogen-fuelled heavy vehicles
3 Technology transition – iron and steel-making	<ul style="list-style-type: none"> The transition in blast furnaces to clean processes (e.g. Direct Reduction Iron (DRI), hydrogen, Carbon Capture and Storage (CCS), Carbon Capture, Utilisation and Storage (CCUS)) does not happen on a large scale US steel producers convert blast furnaces to DRI and Electric Arc Furnaces (EAF) to benefit from the low cost and high availability of natural gas 	<ul style="list-style-type: none"> European iron-making transitions to clean processes (e.g. hydrogen, DRI, CCS, CCUS). The speed of the transition is dictated by the availability of green hydrogen in large quantities Some US blast furnaces are converted to hydrogen, others to DRI and EAF Chinese steel plants convert to clean iron and steel-making processes, albeit at a slower pace Little or no transition outside China, the EU and the US 	<ul style="list-style-type: none"> Fast transition of iron-making to clean processes in all regions; blast furnaces are revamped ahead of their normal schedule European and Chinese integrated steel-making grows primarily in hydrogen-based iron production, implementing CCS and CCUS technologies as well DRI and EAF grow in the US (benefitting from the availability of low-cost shale gas), and Europe Customers also invest to increase the performance of furnaces, including downstream of casting
4 High-technology steel market	High-technology steel market grows at 0.9% per year	High-technology steel market grows at 1.2% per year (light-weighting and material efficiency efforts by downstream industries accelerate shift from lower to higher performance grades)	High-technology steel market grows at 1.6% per year (light-weighting and material efficiency efforts by downstream industries accelerate shift from lower to higher performance grades)
5 Aluminium market	Aluminium market grows at 3% per year, especially High Pressure Die Casting (HPDC) and Low Pressure Die Casting (LPDC) processes	Aluminium market grows at 5% per year (driven by the demand for transportation, construction and packaging) until 2030. Growth of HPDC/LPDC at a higher pace in the US and EU markets. Moderate development of secondary aluminium casting	Aluminium market grows at 7% per year (driven by the demand for transportation, construction and packaging) until 2025. Growth of HPDC/LPDC at a higher pace in the US and EU markets. Rapid development of secondary aluminium casting
Potential financial impact by 2035 (profit before tax)	-£5m to £0m	£0m to £5m	£5m to £10m

Tackling climate change

Key factors impacting Vesuvius' three climate change scenarios

1

Regulatory and macroeconomic drivers differentiate our scenarios

Firstly, effective border adjustment mechanisms to accompany carbon taxation, or cap and trade systems in regions with ambitious emissions reduction objectives, will greatly support the implementation of technologies required to decarbonise steel-making (including the development of hydrogen as the reducing agent). Conversely, the absence or ineffective implementation of border adjustments would lead to significant delocalisation of the steel industry and a displacement of CO₂ emissions to other countries rather than a significant reduction on a worldwide scale. The energy crisis which started in late 2021 and was particularly acute in Europe has resulted in additional costs and loss of competitiveness for the European steel industry. In the short term, this was addressed by the temporary stoppage of steel plants. If the energy cost gap with other regions continues, this could result in the permanent closure of steel plants and delocalisation of production to other regions. This shift in our customer footprint would lead to the need to adapt our own manufacturing footprint.

Secondly, public policy and investment financing will significantly affect the relative cost and availability of non-CO₂ emitting energy sources versus fossil fuels and their associated infrastructures. These will greatly influence the pace of deployment of selected technologies and industries (electric vehicles, carbon-free hydrogen and decarbonised steel-making). Infrastructure, construction and other downstream markets will also be incentivised to reduce steel consumption, accelerating the shift towards high-technology steel. Investment incentives and rising energy costs, as experienced since the end of 2021, will positively affect the growth rate of investment in renewable energies and penetration of electric vehicles in the automotive markets.

Finally, the level of international cooperation to encourage and support less developed economies to engage in the technology transition will also affect our customer manufacturing footprint.

Regulatory and macroeconomic drivers may affect our climate change scenarios in the short, medium and long term.

2

The future of steel

All three scenarios assume that the strong connection between world GDP and world steel output will continue, supported by urbanisation and rising living standards, as there is no significant substitute for steel. The fight against climate change is expected to have a far-reaching impact on many different industries translating into the accelerated growth of the high-technology steel segment in which Vesuvius has a key presence. For example, solar and wind power plants, where investment is growing fast, are far more steel-intensive per kWh of installed capacity than their fossil fuel equivalents. Likewise, hydrogen transportation, another area of rapid growth, also requires considerable amounts of special grades of steel for new pipelines and ships. With evolutions occurring over many years, this driver will have a stronger impact over the medium and long term than the short term.

3

Technology transition

Our scenarios consider the pace and extent of the technology transition in iron and steel-making. The Blast Furnace – Basic Oxygen Furnace (BF–BOF) route for steel-making is significantly more CO₂ intensive than the Electric Arc Furnace

(EAF) route. However, EAFs cannot always be used to produce all higher-quality steel grades and they rely on the availability of scrap steel (itself a function of the level of economic development). Going forward, quality levels produced by EAFs will continue to improve.

Various technologies to decarbonise the BF–BOF route are being developed, including solutions which seek to capture the carbon as it is emitted and either store it or use the carbon in other processes. Alternatively, the BF–BOF route may be replaced by a combination of Direct Reduced Iron (DRI) and EAFs.

Hydrogen-based DRI associated with EAFs has the potential to be nearly carbon-free if carbon-free electricity and hydrogen are available. We anticipate that there will be a gradual reduction in steel production via the BF–BOF route and growth in the EAF route. The extent and pace of this change will depend on technologies coming to maturity, the availability of infrastructure (carbon-free electricity and hydrogen), and regulatory frameworks.

These technologies will require many years to mature and be deployed on a large scale. This driver is therefore expected not to have any impact over the short term, and to reach its maximum impact in the long term.

Tackling climate change

Climate change related metrics

We routinely monitor a large number of metrics, both internal and external, to assess the ongoing validity of our assumptions and identified risks and opportunities, and to monitor the progress of actions. Some of the main metrics are listed in the table below:

External metrics

– Projected compound annual growth rate (CAGR) of the high-technology steel segment	+2.7% between 2022 and 2032 (vs 0.5% for commodity steel)
– Projected CAGR of the wind turbine market	13% (between 2023 and 2030)
– Projected CAGR of the electric vehicle market	18.5% (between 2024 and 2031)
– Projected CAGR of the hybrid vehicle market	7% (between 2024 and 2031)
– Projected CAGR of the internal combustion engine vehicle market	-11% (between 2024 and 2031)
– Projected CAGR of the EAF market	4% (between 2023 and 2029)

Internal metrics

– Steel sales into the EAF market	27% in 2024
– Percentage of Flow Control sales from high-technology steel	58% in 2024
– Percentage of Foundry sales into non-ferrous markets	19% in 2024
– Percentage of sales realised with products which did not exist five years ago	19% in 2024
– Energy intensity (kWh per kg product packed for shipment)	10.1% reduction (pro forma ¹) in 2024 vs 2019 baseline
– R&D spend	+5% p.a. from 2020 to 2024
– Number of sites at high risk of water stress or at least one type of weather event	39 in 2024
– Number of sites with negative or poor risk ratings from the insurance loss prevention risk evaluation	6 in 2024

1. Pro forma: performance as if the dolime process had been operating normally in 2024 (based on average production levels for 2019–2022). See page 22 for further information.



Tackling climate change

Conclusion on strategic resilience

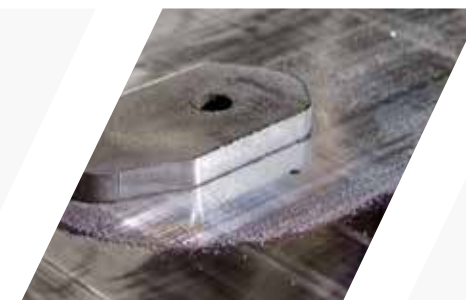
Sustainability has always been at the heart of Vesuvius' business and the Group's analysis concludes that the opportunities for the Group manifested by the global pressure to mitigate climate change outweigh the risks. Our technology helps our customers improve their process efficiency and their environmental footprint.

We estimate the financial impact of the opportunities and risks on the Group will be most adverse under a 4°C scenario and most positive under a 2°C scenario. Under all three scenarios, we expect to benefit from the continuing growth in the production of steel in line with GDP, along with the accelerating shift towards higher performance iron and steel castings, as we support customers to maximise the efficiency and quality of their production. With our technological expertise, strong customer relationships and broad manufacturing footprint, we expect to play a key role in supporting our customers' efforts to decarbonise their operations.

We also believe there is a low downside for Vesuvius in all three scenarios as more than 70% of our business in steel is in the steel casting part of the operation which, as a stand-alone process, is low CO₂ emitting (1% to 3% of a steel plant's CO₂ emissions), and which we do not expect to be affected by technology shifts that the decarbonisation of iron and steel-making will require.

Whilst the electrification of light vehicles and ongoing light-weighting efforts are expected to translate into a shrinking of the market for certain iron castings, it is anticipated that this will be more than compensated for by the growth in other markets such as wind turbines and aluminium castings.

We do not anticipate that climate change will lead to any significant changes in our access to capital or require the impairment of assets on a material scale.



Our roadmap to net zero

Energy conservation and CO₂e emissions reduction to mitigate climate change

Our ambitions

Vesuvius is committed to minimising direct and indirect CO₂, and other greenhouse gas emissions, by reducing the energy intensity of our business and using cleaner energy sources.

We support the Paris Agreement and have committed to reach net zero CO₂e emissions by 2050 (Scope 1 and Scope 2).

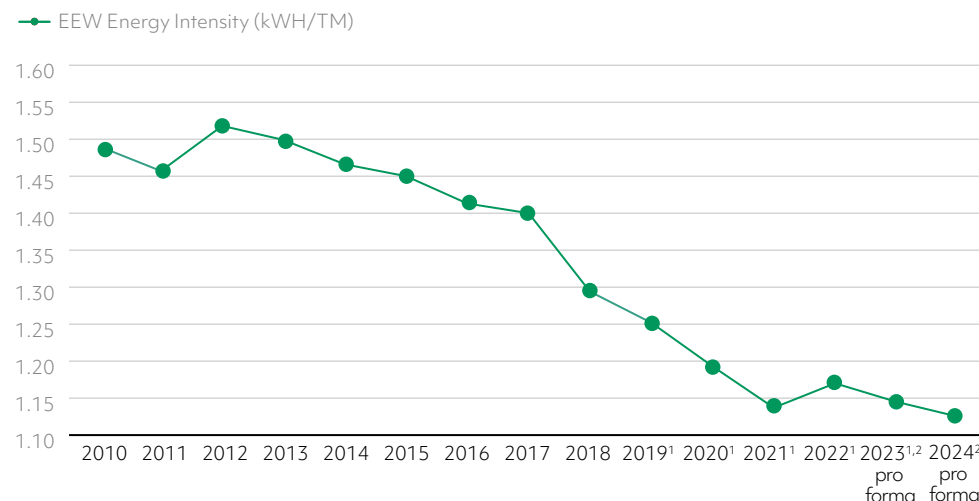
Our Transition Plan currently covers Scope 1 and Scope 2 emissions. We plan to start expanding it to cover our Scope 3 emissions in 2026. Preliminary interaction and collection of data from our main suppliers has begun.

Our history

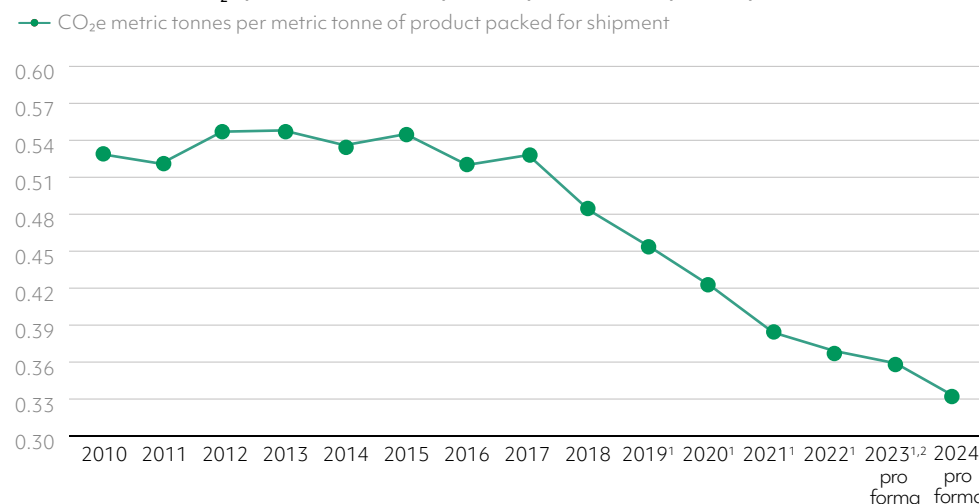
Our first commitment to reducing energy consumption and GHG emissions dates back to 2011 and the launch of Vesuvius' Energy Conservation Plan. In 2024, our pro forma² energy consumption per tonne of product packed for shipment was 22.8% lower than in 2011. In addition to improving our energy efficiency, we have been transitioning to cleaner sources of energy. We have eliminated coal, coke and diesel as energy sources from nearly all our industrial processes, replacing these fuels with lower carbon-intensive alternatives such as biomass, natural gas or electricity. Since 2019, we have started converting to non-CO₂ emitting sources of electricity. As a result, our pro forma² CO₂e emissions in 2024 were 26.9% lower than in 2019.



kWh of energy per metric tonne of product packed for shipment (pro forma)



Metric tonnes of CO₂e per metric tonne of product packed for shipment (pro forma)



1. Re-baselined using pre-acquisition data for the business acquired from Universal Refractories, Inc. (Vesuvius Penn Corporation) and BMC (Yingkou YingWei Magnesium Co., Ltd) from 2019 onwards.

2. The numbers are collated from 100% of entities within the Group's Operational Control Boundary.

3. Pro forma: performance if the dolime process had been operating normally throughout 2023 and 2024.

Our roadmap to net zero

We have set intermediate targets in our journey to reach net zero CO₂e emissions by 2050 (Scope 1 and Scope 2), in line with the Paris Agreement and the UK's commitment in the Climate Change Act 2008 (2050 Target Amendment) Order 2019. These emissions encompass the seven GHGs listed by the Intergovernmental Panel on Climate Change in the Kyoto Protocol (CO₂, CH₄, N₂O, HFCs, PFCs, SF₆ and NF₃).

Our preferred metrics to monitor progress with our journey to net zero are energy and CO₂e emission intensity (energy consumption and CO₂e emissions per metric tonne of product packed for shipment). These reflect the progress made in our operations better than absolute metrics. Managing this energy intensity not only has environmental benefits, it is also part of our long-term strategy to enhance our cost competitiveness.

Our targets

Our targets cover 100% of Vesuvius' operations. They are aligned with the Science Based Targets initiative (SBTi) requirements for a well below 2°C global warming scenario and are consistent with the Paris Agreement. 2019 was selected as the baseline for all energy and GHG emissions data and targets, absolute and relative, as this was the last year of normal trading prior to the COVID-19 pandemic.

- 10% improvement in the Group's energy intensity between 2019 and 2025
- 20% reduction in CO₂e emission intensity normalised per metric tonne of product packed for shipment (Scope 1 and Scope 2) by 2025 (vs 2019 baseline)
- 100% carbon-free electricity by 2030
- A reduction in total Scope 1 and Scope 2 CO₂e emission intensity of 50% by 2035 (vs 2019 baseline)
- Zero Scope 1 and Scope 2 CO₂e emissions by 2050

Our GHG emission reduction targets are science based and compatible with limiting global warming to 2°. We cannot commit to a 1.5° aligned GHG emissions reduction path because of the large proportion of Scope 1 emissions coming from the dolime product line whose emissions are hard to abate. We do not anticipate that carbon capture technologies will be available in the short and medium term to address process emissions from the chemical reaction in the process.

Our GHG emission reduction targets were not established using a sectoral decarbonisation pathway. They are gross targets, meaning that removals, carbon credits or offsets, or avoided emissions as a means of achieving the GHG emissions reduction targets, are excluded (or only to address the residual 5% emissions).

When defining our 2050 and intermediate Scope 1 and Scope 2 targets, we considered the following factors in particular:

- Conversion to carbon-free electricity sources (main driver of the elimination of Scope 2 emissions)

- Energy efficiency improvements of existing assets and assumptions on the availability of technologies at scale and affordability to convert curing and firing processes from natural gas and LPG to alternative sources of energy (main driver of the elimination of Scope 1 emissions, except for dolime)

We did not include any assumptions regarding nature-based solutions in the short term and in the foreseeable future.

The Group energy CO₂e emissions reduction targets have been cascaded to all Business Units, which have built action plans accordingly. Portions of the Group Executive Committee's Long-Term Incentive Plan and senior management annual variable compensation are linked to the achievement of CO₂e emissions reduction targets.

As we are reaching the end of the 2020–2025 cycle, in 2025 we plan to establish a 2030 intermediary goal for Scope 1 emissions intensity reduction.

We plan to set Scope 3 emissions reduction targets at a later stage, as part of the Transition Plan.

Our roadmap to net zero

Our plan

Some significant assumptions underpin our net zero plan, including:

- The availability of the necessary technologies, at an affordable level and at a scale appropriate for our industry, especially for the firing of refractory ceramics and carbon capture (including carbon capture technologies for the dolime production process)
- The development of additional production capacity and distribution infrastructure for renewable energy and hydrogen, and their cost competitiveness
- Adequate policy support to foster innovation and ensure the cost of CO₂ emissions will increase the attractiveness of carbon-free processes
- No significant change to our business model and product portfolio

Our roadmap to net zero is based on five key areas of focus:

- **Modernising** and upgrading installed equipment to reduce our energy consumption
- **Investing** to renew equipment to the best available technologies and converting to less CO₂e intensive energy sources
- When possible, **replacing** high CO₂e emission electricity (generated from coal or natural gas) with greener electricity or other sources of energy
- **Reducing** our energy wastage, recovering heat to feed processes and heat water
- **Generating** clean energy

The achievement of our CO₂e emissions targets will also be sensitive to:

- The growth of revenue, organically, and from acquisitions, and divestitures
- Product mix evolution (especially driven by dolime volume, which is the most CO₂ intensive product line)
- Macroeconomic conditions and the CapEx cycle impacting plant loading (and thereby the energy efficiency of continuous processes)

Our organisation and resources allocated to our plan

We have undertaken a Group-wide programme of energy efficiency and established formal efficiency programmes in all Business Units and regions. Each Business Unit has nominated dedicated leaders to oversee and coordinate the efforts to improve energy efficiency and reduce GHG emissions. They coordinate with the Regional Business Unit Vice Presidents and the engineering teams in each plant. Their role is to benchmark performance across locations, support the identification and selection of the most valuable projects, assist in the preparation and implementation of capital expenditure projects, and monitor progress and KPIs. Each site manager is responsible for elaborating and leading the action plans for their site.

Progress is reviewed by the Sustainability Council and the Board every quarter.

In parallel with this, the Central engineering team is working in collaboration with external research institutions and equipment manufacturers to develop and test novel manufacturing technologies that will emit far less GHGs than the existing processes. These programmes typically have a five to ten-year horizon.

It is estimated that we will need to invest c.£7m of incremental capital expenditure per year until 2035 to support our roadmap. The study and development of novel production processes has been integrated into the scope of our R&D and engineering teams. As we cooperate with scientific institutions and equipment manufacturers, we anticipate that the organisation is adequately resourced to undertake decarbonisation projects. No additional operating costs are foreseen during this period. We do not anticipate any significant impact on our workforce due to the implementation of the Transition Plan.

Our roadmap to net zero

Next steps to achieve our net zero plan

Our plan to reach net zero covers 100% of our operations. We aim to achieve our decarbonisation goals without the use of any carbon offsets (or only to address residual emissions).

Scope 1, 2 and 3 CO₂e and CO₂e emissions

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

Scope 3 includes all other indirect emissions that occur in the Company's value chain.

In the short and medium term, we will focus on reducing the Scope 1 and Scope 2 emissions of product lines other than dolime. We have made investments in recent years to optimise the energy efficiency and reduce the CO₂ intensity of this process. Further significant improvements will require investing in technologies such as carbon capture, which we anticipate will not be available at an affordable level and at an appropriate scale, in the short and medium term.

Short term (2026)

A wide variety of projects have been initiated and more are being considered, to help us deliver our energy efficiency and CO₂e emissions reduction targets, including:

- Optimisation of process parameters
- Introduction of new refractory furniture

- Retrofitting of ovens and kilns
- Replacement of older and less efficient units
- Upgrades of compressors
- Replacement of light sources with LED lights
- Replacement of diesel-powered forklift trucks with electric forklift trucks
- Installation of heat recovery systems in ovens and kilns

- Burner setting optimisation and loading, and cycle optimisation
 - Continued conversion of electricity supplies to carbon-free sources
 - Installation of solar panels
- We endeavour to use the best available technologies to reduce CO₂ emissions in all our major capital expenditure projects.

Medium term (2035)

We anticipate that further emissions reduction will be possible through further energy efficiency measures (continuation of the short-term actions).

Technological developments currently in preparation with our partners will allow us to reduce GHG emissions even further. Projects have been launched across a range of activities including:

- Electrification of high-temperature manufacturing processes that currently rely on natural gas or LPG. The first investments to replace natural gas-powered ovens with electric ovens were completed at the end of 2024
- The use of a combination of natural gas and renewable energy such as carbon-free hydrogen to fire refractory materials. We have already started R&D trials with a blend of hydrogen and natural gas

- The use of bio-fuels instead of natural gas. The first investments to replace natural gas with biomethane were completed in 2024
- Whilst the list of assets that will require upgrade or replacement is defined, a precise time plan cannot be elaborated beyond the next few years:
- Electric and hydrogen-powered high-temperature processes are still in the development phase and not ready for industrial-scale deployment. The manufacture of each product family in our portfolio requires a specific set of parameters such as type of process (batch vs continuous), temperature and atmosphere. It is still too early to decide which technological solutions will be possible and most appropriate for each process
 - All high-temperature processes will require an adequate and affordable supply of carbon-free energy to be economically viable. Availability and price trajectories may vary greatly from region to region

These low-carbon production processes should be progressively introduced during the 2025–2035 period, as they meet the technical and economic conditions allied with the availability of required energy. Precise capital expenditure project lists have been defined for the 2026 horizon and are in preparation for the next few years. We estimate the incremental capital commitment required by our decarbonisation roadmap will be approximately £7m per year until 2035.

We do not expect the useful economic lives of our existing assets to be materially affected by our plans until 2035. We will continue using the internal price of carbon to assess the relative benefits and prioritise projects.

We also anticipate that changes in our product portfolio towards less energy-intensive products (such as resin-bonded and unshaped refractories) will continue, though the impact cannot be quantified.

Long term (2050)

Beyond 2035, the short-term and medium-term programmes will continue to deliver opportunities.

We are regularly monitoring the emergence and readiness of new technologies, through our network of suppliers of capital goods, universities and trade associations.

In the longer term (2050), various technologies are promising candidates for the near zero emissions curing and firing of refractory products (electricity, carbon-free hydrogen, synthetic gas, biomass).

We currently anticipate that carbon capture solutions will be available for our industrial application during the 2035–2050 period, though most will probably not be available sooner.

We are progressively adapting our product and process R&D programmes to explore such opportunities.

Capital expenditure requirements and the useful economic lives of our existing assets will depend on the evolution of technologies currently in development.

Our roadmap to net zero


 Return to our [Net zero CO₂e emissions](#) priority

Our progress

Since 2019, we have undertaken a number of major projects to significantly reduce the Scope 1 CO₂e emissions of the Group by addressing some of its most CO₂e intensive installations.

We closed the Skawina brick plant, eliminated dirty coke oven gas as a fuel in Wuhan, replacing it with a new natural gas-fired tunnel kiln, transferred the Tyler plant activity to Monterrey, and replaced the burner system of the Olifantsfontein rotary kiln. We also took advantage of the closure of our Chinese plant at Kuatang and the relocation of its activity to replace all drying ovens and kilns with new ones, with an energy efficiency improvement target of 20%.

In 2024, our plant in Rio de Janeiro converted all of its natural gas-based production processes to biomethane. CO₂e emissions from the Rio de Janeiro plant are now at zero.

1 Carbon-free energy sources

The Group supports the transition towards renewable energy sources and cleaner carbon-free technology when possible. Our energy strategy includes an ongoing effort to convert to carbon-free electricity contracts whenever practical and economically viable, investment in solar panels, and the conversion of processes to electricity as soon as the technology is cost-effective.

In 2024, three sites converted to carbon-free electricity contracts. At the end of 2024, we had 43 sites with carbon-free electricity contracts, representing 75% of our manufacturing sites and R&D centres of excellence.

81% of the grid electricity consumed in our sites in 2024 was generated from renewable sources (71% in 2023), and 83% using processes that did not emit CO₂e (renewable and nuclear) (75% in 2023).

A third Vesuvius plant became carbon-free in 2024, with Rio de Janeiro converting all of its natural gas-based production processes to biomethane. CO₂e emissions from the Rio de Janeiro plant are now at zero.

In addition, capital expenditure projects for solar panels with a value of £0.3m were approved in 2024. Ten of our sites are now equipped with photovoltaic solar panels and 19 sites are investigating solar panel projects.

2 Capital commitments and internal CO₂ pricing

We include an environmental impact analysis in the evaluation of our capital expenditure projects as these are the key decisions that drive long-term future sustainability performance, and CO₂ emissions in particular.

Our Environmental Policy, which is the responsibility of the Chief Executive and the Group Executive Committee, covers all our operations and states that all our investment decisions will include an analysis of their environmental impact. An internal price for CO₂ emissions (Scope 1 and Scope 2) is included in the calculation of payback for all investments reaching the threshold for approval by the Business Unit Presidents or Chief Executive.

Vesuvius views this shadow pricing mechanism as a key tool to ensure that the environmental impact of long-term investment decisions is understood.

It seeks to ensure that the best available technology is adopted, even in locations where no external cost for carbon is in place or foreseen. The internal price of CO₂ was introduced in 2020. It is reviewed annually by the Sustainability Council and is applicable across all Business Units in all regions. The price is adjusted, taking into consideration both the previous year's price and the evolution of the EU Emissions Trading System (EU-ETS) carbon pricing. In 2020, it was initially set at €30 per tonne of CO₂. It was raised to €90 per tonne in 2021, and subsequently maintained at this level. The Sustainability Council has decided to maintain the internal price of CO₂ emissions at €90 per tonne of CO₂ for 2025.

83%

of our electricity is from carbon-free sources

Our roadmap to net zero


 Return to our
 Net zero CO₂e emissions priority

Our progress continued

3

Improving our energy efficiency

All Vesuvius plants have targets to reduce energy intensity. We have implemented a structured approach across the Company. We collect and analyse data from our sites, identify gaps and opportunities and eventually target our engineering projects. We select the processes and sites that are the most energy-intensive or have the greatest impact, and coordinate the projects centrally. We also share best practices across locations. For example, in one of the most energy-consuming sites, we will improve our process by installing additional nozzles in the spray towers, building on the experience from another Vesuvius site. Many additional initiatives are managed locally.

-26.9%

Pro forma¹ reduction of Scope 1 and Scope 2 CO₂e emission intensity per metric tonne of product packed for shipment vs 2019

¹ Pro forma performance calculated as if dolime production had been operating normally in 2023 and 2024. The actual reduction in Scope 1 and 2 CO₂e emission intensity in 2023 was 18.6% and in 2024 was 40.4%.

In 2024, the first investments replacing natural gas-powered ovens with electric ovens were completed, as part of our plan to electrify high-temperature manufacturing processes that currently rely on natural gas or LPG. We also ran R&D trials focusing on the use of a combination of natural gas and carbon-free hydrogen to fire refractory materials, and completed the first investments in replacing natural gas with biomethane. During the year, we also continued the deployment of meters on energy-intensive equipment.

We are encouraging sites to carry out energy audits and pursue ISO 50001 certification. 13 sites carried out energy audits in 2024, and 31 have planned audits in 2025. Three sites have already obtained ISO 50001 certification. This combination of initiatives allows us to better identify and analyse opportunities and target investments on projects with the largest impact. More than 4,700 employees have received training on energy conservation and greenhouse gas emissions reduction.

In 2024, as a result of thermal processes optimisation and the installation of retrofit solutions, we have reduced energy consumption by more than 15 GWh per year and CO₂e emissions by 20 KT versus 2023.

New capital expenditure worth c.£7m, dedicated to 122 projects with energy efficiency and CO₂ emissions reduction as one of their prime objectives, was approved in 2024. In 2024, we continued the deployment of meters on energy-intensive equipment.

Our results

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. Dolime production (based in South Africa), which uses coal to calcine dolomite, is our major emitter of CO₂. Dolime and the next five of our 39 main manufacturing processes account for 61% of our energy consumption and 69% of our location-based CO₂e emissions. These continue to be a clear focus for our investment to reduce CO₂e emissions.

In January 2023, an incident incapacitated one of our dolime rotary kilns, which resulted in it being out of service for over a year. As a consequence, the tonnage of dolime produced by the Group has been considerably lower than in prior years and the Group's product mix has been very different. The Group's absolute energy consumption, CO₂e emissions, energy intensity and CO₂e emission intensity

reduction have been affected by the lower output of dolime, which has higher energy and carbon intensity than most of our production processes. The dolime installation resumed production in 2024 albeit at a lower level than prior to the 2023 incident.

The Group's progress in reducing our CO₂e emission intensity was adversely affected in 2024 by the increase in dolime production. Low volumes of other product lines resulted in lower fill rates for continuous processes and lower energy efficiency, thereby also contributing to a higher CO₂e emission intensity. Between 2019 and 2024 the Group achieved an overall reduction in energy intensity (normalised to per metric tonne of product packed for shipment) of 14.0%. The pro forma energy intensity reduction assuming the Group had produced dolime at the normal rate, was 10.1% vs a target of 10% by 2025.

During the same period, our overall CO₂e emission intensity metric (CO₂e emissions per metric tonne of product packed for shipment, Scope 1 and Scope 2, market-based) reduced by 40.4% vs a target of 20% by 2025. This includes a 40.2% reduction in energy CO₂e intensity, and a 41.2% reduction in process CO₂e intensity, per metric tonne of product packed for shipment. Excluding dolime, the CO₂e emission intensity reduction between 2019 and 2024 was 40.2%.

Our roadmap to net zero



Our results continued

If the production of dolime had remained on average the same as the 2019–2022 period, prior to the dolime incident, our pro forma CO₂e emission intensity reduction would have been 26.9%.

The conversion by many of our sites to carbon-free electricity contracts has helped our CO₂e emissions reduce at a faster pace than our energy efficiency improvements.

Vesuvius' total energy costs in 2024 were £45.6m, c.2.5% of revenue (£48.5m in 2023, c.2.5% of revenue). None of our installations meet the criteria to be included in the EU-ETS. South Africa is the only country where we exceed the threshold to be submitted to a carbon tax or an emissions trading scheme. The carbon tax cost in 2024 was c.£ 0.1m (£0.2m in 2023), based on emissions in the prior year.

In 2024, Vesuvius did not engage in any greenhouse gas removal activities within its own operations or upstream or downstream value chain, nor did we finance any removal projects outside our value chain through the purchase of carbon credits.

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

Scope 3 covers all other direct CO₂ and CO₂e emissions that occur in the Company's value chain.

CO₂e emissions intensity evolution – 2019 to 2024 performance (aggregate of Scope 1 and Scope 2)^{1,2,3}

	2024 Pro forma vs 2019 %	2024 actual vs 2019 %	2024 Pro forma	2024	2023 Pro forma	2023	2022	2021	2020	2019
CO ₂ e metric tonnes per metric tonne of product packed for shipment	-26.9%	-40.4%	0.331	0.270	0.359	0.245	0.369	0.384	0.421	0.453
CO ₂ e metric tonnes per million £ of revenue	-36.5%	-50.6%	171	133	172	108	172	242	266	269

1. Re-baselined using pre-acquisition data for the business acquired from Universal Refractories, Inc. (Vesuvius Penn Corporation) and BMC (Yingkou YingWei Magnesium Co., Ltd) from 2019 onwards.

2. The numbers are collated from 100% of entities within the Group's Operational Control Boundary.

3. Pro forma: performance if the dolime process had been operating normally throughout 2023 and 2024.

Vesuvius plc long-term energy consumption and energy intensity (aggregate of Scope 1 and Scope 2)^{1,2,3}

	2024 Pro forma vs 2019 %	2024 Actual vs 2019 %	2024 Pro forma	2024	2023 Pro forma	2023	2022	2021	2020	2019
Total energy consumption (million kWh)			1,054	963	1,057	896	1,086	1,200	1,066	1,211
Energy consumption per metric tonne of product packed for shipment (kWh/MT)	-10.1%	-14.0%	1,125	1,076	1,145	1,054	1,170	1,137	1,193	1,252
Energy consumption per million £ of revenue (kWh/ME)	-22.0%	-28.8%	579,277	529,112	547,682	464,108	544,931	717,996	752,313	742,730

1. Re-baselined using pre-acquisition data for the business acquired from Universal Refractories, Inc. (Vesuvius Penn Corporation) and BMC (Yingkou YingWei Magnesium Co., Ltd) from 2019 onwards.

2. The numbers are collated from 100% of entities within the Group's Operational Control Boundary.

3. Pro forma: performance if the dolime process had been operating normally throughout 2023 and 2024.



For additional details on energy consumption and GHG emissions, see Further information P142–159 ➔

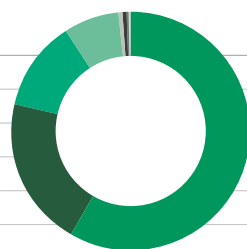
Our roadmap to net zero



Our results continued

2024 energy consumption by fuel type %

Energy consumption	2024	
	'000 kWh	%
Natural gas	562,526	58.4%
Electricity	196,397	20.4%
Coal	117,117	12.2%
LPG	71,585	7.4%
Biomethane	6,429	0.7%
Other fuels	4,206	0.4%
Solar PV	2,688	0.3%
External heat	2,100	0.2%
Total	963,048	100%

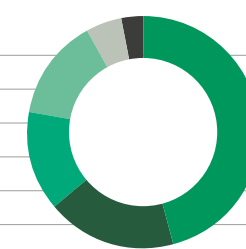


Notes:

- The numbers are collated from 100% of entities within the Group's Operational Control Boundary.

2024 Scope 1 and Scope 2 CO₂e emissions per region (market-based) %

Metric tonnes CO ₂ e	2024	
	Metric tonnes	%
Africa	111,583	46%
Europe and Middle East	42,866	18%
USA, Mexico, Canada	33,866	14%
China & NA	33,891	14%
India & SA	12,323	5%
South America	6,866	3%
Total	241,395	100%



Notes:

- The numbers are collated from 100% of entities within the Group's Operational Control Boundary.

Vesuvius plc long-term CO₂e emissions and CO₂e emissions intensity (market-based), aggregate of Scope 1 and Scope 2^{1,2,3}

	2024 Pro forma vs 2019 % ^{1,2,3}	2024 Actual vs 2019 % ^{1,2,3}	2024 Pro forma ^{1,2,3}	2024 ^{1,2,3}	2023 Pro forma ^{1,2,3}	2023	2022	2021	2020	2019
Total Scope 1 and Scope 2 CO ₂ e emissions (MT)			310,441	241,395	331,298	208,063	342,105	404,861	376,312	437,928
Scope 1 and Scope 2 CO ₂ e emissions per metric tonne of product packed for shipment (MT/MT)	-26.9%	-40.4%	0.331	0.270	0.359	0.245	0.369	0.384	0.421	0.453
Scope 1 and Scope 2 CO ₂ e emissions per million pounds of revenue (MT/M£)	-36.5%	-50.6%	170.6	132.6	171.7	108	172	242	266	269

Notes:

- Includes the business of Universal Refractories Inc (Vesuvius Penn Corporation) which was acquired in 2021 and BMC (Yingkou YingWei Magnesium Co., Ltd), which was acquired late 2022.
- The numbers are collated from 100% of entities within the Group's Operational Control Boundary.
- Pro forma: performance if the dolime process had been operating normally throughout 2023 and 2024.

10.1%

Pro forma³ energy intensity reduction between 2019 and 2024



For additional details on energy consumption and GHG emissions, see Further information P142-159 ➔

Our roadmap to net zero

Our results continued

Scope 3 emissions

Vesuvius' Scope 3 CO₂e emissions, mainly upstream, contribute to a greater part of our total CO₂e emissions than our Scope 1 and Scope 2 emissions. Our products are used by customers whose processes emit significant amounts of CO₂. They serve to contain and protect liquid metal and manage its flow, but do not participate in the heating operations or chemical reactions that lead to CO₂ emissions. Emissions associated with the processing or use of our products are hence very limited. More specifically:

- Some products require drying or pre-heating prior to use by our customers. Emissions generated during these operations are included in the 'Processing of sold products' category
- Refractory materials do not require energy during their use; having undergone high-temperature processes during their manufacturing, they are inert and do not release any greenhouse gases during their use
- Some non-refractory products contain chemicals, which will be partially burnt during usage by our customers. Emissions due to the combustion of chemicals are included in the 'Use of sold products' category

Since 2021, we have undertaken a focused evaluation of emissions associated with raw materials, using publicly available average CO₂ emissions factors. We have also collected information on energy source, CO₂ emissions data and reduction plans from our raw materials suppliers as part of our Request for Quotation process. In 2024 we have started collecting cradle to gate Product Carbon Footprint information from our suppliers.

When CO₂ emissions information is not available from suppliers or other reputable sources, we use fallback values provided by the World Refractory Association.

We have begun to collect CO₂ emissions data relating to transportation from our forwarders in all regions. In 2024, the CO₂ emissions data that we received from our forwarders covered 26% of our transportation spend (upstream and downstream), and we were able to evaluate CO₂ emissions covering a further 61% of our transportation spend using operational data and Defra conversion factors. The remainder of our CO₂ emissions from upstream and downstream transportation (13%) was estimated based on spend and Defra conversion factors.

Various initiatives have been launched to reduce our Scope 3 CO₂ emissions, including:

1. Returnable packaging solutions being implemented both with suppliers and customers
2. Electrification of Company fleet vehicles being deployed in various countries
3. The encouragement of commuting to work by bus or other forms of collective transportation services. 46 Vesuvius sites organise such services for more than 2,100 Vesuvius employees

4. Encouraging suppliers to switch to renewable energy sources
5. CO₂ emissions awareness sessions for more than 200 key suppliers (in 2023)

Our process for evaluating Scope 3 CO₂ emissions continues to evolve, as assessment techniques become more sophisticated. In 2023, this re-evaluation included adopting a more granular approach to our assessment of emissions from raw materials, where we more than doubled the number of factors used, to achieve more refined data on emissions from purchased goods.

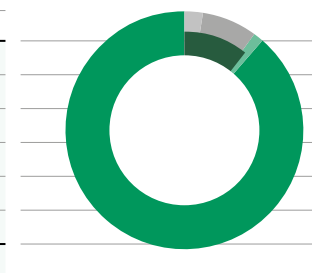
Scope 1, Scope 2 and Scope 3 emissions (market-based)¹

In 2024, Vesuvius' total Scope 1, Scope 2 and Scope 3 CO₂e emissions were 2,003,560 metric tonnes. This represented 1,100 metric tonnes per million £ revenue.

Metric tonnes CO ₂ e	2024	
	Metric tonnes	%
■ Scope 1 CO ₂ e emissions	215,591	10.76%
■ – Scope 1 Process CO ₂ e emissions	57,926	26.9%
■ – Scope 1 Energy CO ₂ e emissions ¹	157,090	72.9%
■ – Scope 1 Fugitive emissions	575	0.3%
■ Scope 2 CO ₂ e emissions (market-based)	25,804	1.29%
■ Scope 3 CO ₂ e emissions	1,762,165	87.95%
Total	2,003,560	100.00%

Notes:

1. The numbers are collated from 100% of entities within the Group's Operational Control Boundary.



Our roadmap to net zero

Our results continued

Scope 3 emissions

	2024		2023		2022		2021		2020		2019	
Metric tonnes CO ₂ e	Metric tonnes	%	Metric tonnes	%	Metric tonnes	%	Metric tonnes	%	Metric tonnes	%	Metric tonnes	%
Purchased goods and services	1,451,402	82%	1,441,413	81%	1,381,764	82%	1,744,242	86%	1,446,188	86%	1,502,207	86%
Capital goods	46,048	3%	39,992	2%	33,369	2%	22,007	1%	19,818	1%	25,087	1%
Fuel- and energy-related activities (not included in Scope 1 or 2)	39,473	2%	37,088	2%	45,551	3%	50,931	2%	36,845	2%	42,332	2%
Upstream transportation and distribution	28,516	2%	39,086	2%	45,572	3%	39,887	2%	23,946	1%	26,104	2%
Waste generated in operations	14,391	1%	14,979	1%	15,291	1%	15,119	1%	12,927	1%	3,639	0%
Business travel	9,887	1%	11,443	1%	9,578	1%	5,128	0%	4,670	0%	10,724	1%
Employee commuting	34,470	2%	40,891	2%	42,649	3%	43,449	2%	43,265	3%	44,749	3%
Upstream leased assets	0	0%	0	0%	0	0%	0	0%	0	0%	0	0%
Total Upstream	1,624,188	92%	1,624,892	91%	1,573,775	94%	1,920,763	95%	1,587,659	95%	1,654,842	95%
Downstream transportation and distribution	57,897	3%	80,896	5%	38,899	2%	34,912	2%	23,529	1%	25,700	1%
Processing of sold products	19,250	1%	14,924	1%	15,779	1%	14,078	1%	13,902	1%	14,371	1%
Use of sold products	37,554	2%	34,194	2%	32,914	2%	37,460	2%	31,834	2%	39,645	2%
End-of-life treatment of sold products	23,276	1%	22,103	1%	20,808	1%	22,802	1%	18,757	1%	4,487	0%
Downstream leased assets	0	0%	0	0%	0	0%	0	0%	0	0%	0	0%
Franchises	0	0%	0	0%	0	0%	0	0%	0	0%	0	0%
Investments	0	0%	0	0%	0	0%	0	0%	0	0%	0	0%
Total Downstream	137,977	8%	152,116	9%	108,400	6%	109,251	5%	88,023	5%	84,203	5%
Total Scope 3 CO₂e emissions	1,762,165	100%	1,777,008	100%	1,682,175	100%	2,030,014	100%	1,675,681	100%	1,739,044	100%

Notes:

- Calculation of Scope 3 GHG emissions used the Carbon Footprint Limited Sustrax system for years 2019–2024. The Sustrax tool relies on the UK Government Defra methodology, categories and emission conversion factors. Wherever possible we used activity data which relies on information that is specific to the organisation, and therefore is much more accurate than the spend base method.
- The business of Universal Refractories Inc (Vesuvius Penn Corporation) which was acquired in 2021, is included in 2022 and onwards. BMC (Yingkou YingWei Magnesium Co., Ltd), which was acquired late 2022, is included in 2023 and onwards.
- The numbers are collated from 100% of entities within the Group's Operational Control Boundary.
- Conversion factors for GHG emissions and energy used the 2024 UK Government GHG Conversion Factors for Company Reporting. Conversion factors for GHG emissions for electricity globally used the 2024 IEA Emission Factors.



For additional details on energy consumption and GHG emissions, see Further information [P142-159](#) ➔

Our roadmap to net zero

Vesuvius plc long-term CO₂e emissions and CO₂e emissions intensity (market-based), aggregate of Scope 1, Scope 2 and Scope 3

	2024 Pro forma vs 2019 %	2024 Actual vs 2019 %	2024 Pro forma	2024	2023 Pro forma	2023	2022	2021	2020	2019
Total Scope 1, Scope 2, and Scope 3 CO ₂ e emissions (MT)			2,072,606	2,003,560	2,108,306	1,985,072	2,024,279	2,434,875	2,051,993	2,176,972
Scope 1, Scope 2 and Scope 3 CO ₂ e emissions per metric tonne of product packed for shipment (MT/MT)	2.9%	-0.5%	2.32	2.24	2.48	2.34	2.18	2.31	2.30	2.25
Scope 1, Scope 2 and Scope 3 CO ₂ e emissions per million pounds of revenue (MT/M£)	-14.7%	-17.6%	1,139	1,101	1,092.52	1,029	1,016	1,457	1,448	1,335

Notes:

- Scope 1 and Scope 2 re-baselined using pre-acquisition data for the business acquired from Universal Refractories, Inc. (Vesuvius Penn Corporation) and BMC (Yingkou YingWei Magnesium Co., Ltd) from 2019 onwards.
- The numbers are collated from 100% of entities within the Group's Operational Control Boundary.
- Pro forma: performance if the dolime process had been operating normally throughout 2023 and 2024.

Emissions removal and storage

In 2024 Vesuvius did not engage in any GHG removals and storage. Systems are not in place yet to collect GHG removal and storage data from upstream and downstream value stream.

Vesuvius plc statement of verification



Scope 1, Scope 2 and Scope 3 carbon footprint reporting and supporting evidence contained herein for the period 1 January 2019 to 31 December 2024 covering GHG emissions as CO₂e in metric tonnes, CO₂e intensity in metric tonnes of CO₂e per metric tonne of product packed for shipment, energy consumption in kWh and energy intensity in kWh of energy per metric tonne of product packed for shipment, location-based and market-based, were verified by Carbon Footprint Ltd in accordance with the ISO 14064 Part 3 (2019): Greenhouse Gases: Specification with guidance for the verification and validation of greenhouse gas statements.

A copy of the limited assurance statement can be found on our website: www.vesuvius.com.

Details of the methodology used for GHG data collection and reporting can be found in Further information on page 141.



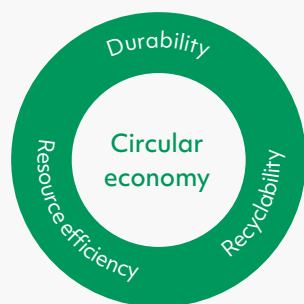
For additional details on energy consumption and GHG emissions, see Further information P142–159 ➔

Using fewer resources

Contributing to the circular economy

The drive to improve the sustainability performance of Vesuvius and the refractory industry's products was initiated many decades ago. Continuous improvements have led to considerable reductions in both the raw materials used and the quantity of product shipped to landfill. As the amount of refractory material consumed per tonne of steel cast levels off, the purpose and value of the use of refractory materials will move from delivering insulation to an even greater emphasis on helping to improve steel quality and process efficiency.

As stated in our Environmental Policy, we aim to promote the development of the circular economy. The Vesuvius product strategy combines multiple approaches.



Product durability

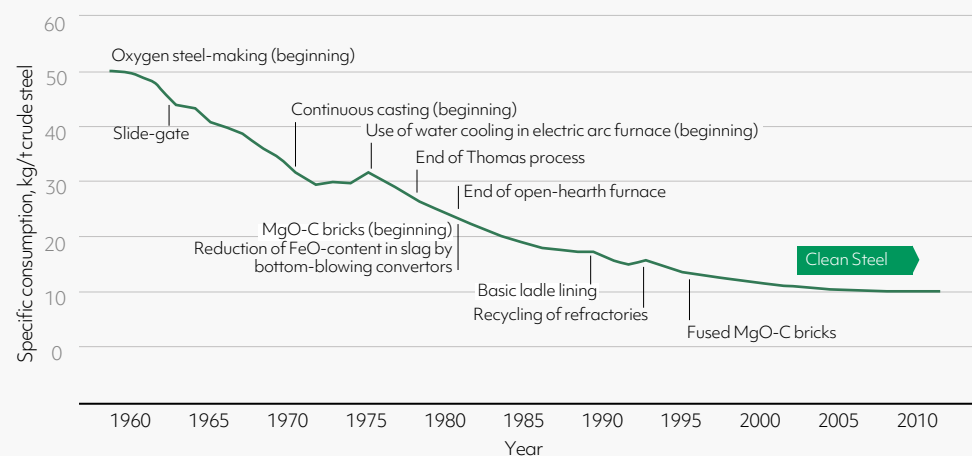
Our first, and preferred, strategy to reduce the depletion of resources is the extension of product durability. The amount of refractory material required per tonne of steel cast has been reduced by 80% since 1960, and the average product lifetime multiplied by as much. Approximately 10 kg of refractory material are now consumed per tonne of steel cast, with some customers requiring as little as 7 kg.

We are continuously working to extend the lifetime of our consumable products. Strategies include the development of advanced materials, the design of shapes that allow dual usage of products, and product repair and remanufacture. For mechanisms and equipment, we also offer wear monitoring and maintenance services to our customers to ensure their optimum performance and extend their lifetime.

We have introduced innovative refractory lining monitoring, to enable repairs to be made only where needed. Our i-GVARD* system automates the monitoring of slide-gate wear, providing decision-makers with critical data to choose when to renew refractory plates. We have developed longer life Duraflex* ladle shrouds, DuraSleeve* sub-entry nozzles, and methodologies to reuse bottom slide-gate plates as top plates. Each of these systems and processes drives production efficiency – thereby reducing energy wastage and reducing our customers' CO₂ emissions – and reduces refractory volumes.

Any failure of the refractory lining of furnaces or ladles can lead to uncontrolled spillage of liquid metal, potentially resulting in serious safety incidents or extensive equipment damage. The laser technologies we have developed allow customers to monitor the wear of refractory linings, and improve the timeliness of repair or replacement decisions. This technology, when used in conjunction with artificial intelligence software, allows the prediction of failures and the further extension of lining lifetimes.

Amount of refractory consumed per tonne of steel cast in Germany



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

Source: Statistisches Jahrbuch der Stahlindustrie.

Using fewer resources

Product recyclability

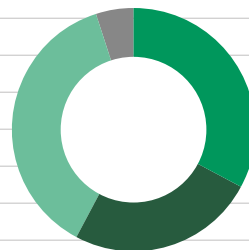
At the same time as reducing the quantity of raw materials required for each casting, technical solutions have emerged to enable the recycling of refractory materials after usage in the production of iron and steel. Whereas in the early 1970s nearly all refractory materials were disposed of after use, it is estimated that more than half are now recycled. In Europe, as little as 5% of refractory materials now go to landfill. A large portion of this is open loop recycling, with spent refractories used in low value-adding applications such as aggregates for roadbed materials.

Closed loop recycling will allow greater substitution of virgin material by secondary material, with a positive impact on Scope 3 CO₂ emissions. It is estimated that only 7% of spent refractories currently enter closed loop recycling.

Many factors, such as consistency of material quality, cost of sorting and mineral processing, transportation costs, and the administrative burden associated with the transportation of waste, have prevented the wide adoption and investment in closed loop recycling. We therefore 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.

Distribution of refractory material after use in the steel industry in Europe %

- 33% Dissolution in hot metal, steel or slags
- 25% Internal recycling
- 37% External recycling
- 5% Landfilling



Source: A review of recycling of refractories for the iron and steel industry, Researchgate November 2017.

End-of-life management

As part of our product end-of-life management programme, we are developing selected initiatives with customers, tailored to each product family, such as:

Recovery and remanufacture of products after usage



Recycling of mechanisms as scrap steel (applicable to 100%)



Recovery and cleaning of spent refractory material for recycling or safe disposal



Refurbishment of lasers and redeployment or entire disassembly and recycling of all components



Products that cannot be recycled or must go to landfill present no danger to the environment, because they are chemically inert



Using fewer resources

Product resource efficiency

Product technology

Similar to the clear environmental advantages solar and wind offer over fossil fuel energy sources, or electric vehicles over internal combustion engines, certain applications can be served by alternative product technologies that are far less CO₂ intensive.

For some uses, it is possible to replace bricks or other products requiring high-temperature firing with resin-bonded refractories, with significantly lower CO₂ emissions. Other applications can be fulfilled by unshaped refractories, which in addition to not requiring high-temperature firing, can be repaired between campaigns, thereby extending their lifetime and reducing the quantity of material to recycle or dispose of after usage.

Vesuvius also offers powder coatings to its Foundry customers. These are mixed with water at the customer's premises rather than in our plants. This offers significant environmental benefits, through the reduced consumption of plastic packaging, reduced weight and volume transported resulting in reduced CO₂ emissions, and increased shelf life.

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 the use 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 throughout Vesuvius' facilities. In 2020, the Board set a target for 7% of the raw materials used by the Group in production to be recycled materials from external sources by 2025 (measured by weight of materials).

Increasing the share of recovered and recycled materials in product formulations poses multiple challenges, in terms of availability, consistency of quality, competitiveness versus virgin materials 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.

2024 performance was adversely affected by these factors, which remain a concern going forwards.

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 Vesuvius uses.

In 2024, 69,255 metric tonnes of recycled materials were used in our products (2023: 65,734). The percentage of recovered or recycled materials from external sources used in production was 6.5% (6.6% in 2023). 18.9% of our revenue was generated from products that include recycled materials (20.7% in 2023).

Recycled material usage

	2024 Pro forma	2024 Actual	2023 Pro forma	2023 Actual	2022	2021	2020	2019
Amount of recycled materials used in Vesuvius products (metric tonnes)		69,255		65,734	64,477	74,501	58,426	70,299
Amount of recovered materials that are not recycled used in Vesuvius products (metric tonnes) ³		0		0	0	0	0	0
Percentage of recycled materials in Vesuvius products from total materials	6.0%	6.5%	5.7%	6.6%	5.7%	5.8%	5.5%	5.9%
Percentage of revenue from products including recycled materials		18.9%		20.7%	20.4%	21.0%	19.6%	18.7%

Notes:

1. Re-baselined using pre-acquisition data for the business acquired from Universal Refractories, Inc. (Vesuvius Penn Corporation) and BMC (Yingkou YingWei Magnesium Co., Ltd) from 2019 onwards.
2. The numbers are collated from entities within the Group's Operational Control Boundary.
3. All recovered materials undergo some processing before their usage in our products. Therefore, they are all included in the recycled materials category, and the recovered materials category is empty.
4. Pro forma: performance as if the dolime process had been operating normally throughout 2023 and 2024.

In 2024, Vesuvius did not engage in any greenhouse gas removal activities within its own operations or upstream or downstream value chain, nor did we finance any removal projects outside our value chain through the purchase of carbon credits. We estimate however that 65,370 metric tonnes of Scope 3 CO₂e emissions were avoided by using recycled materials in lieu of virgin materials in 2024.

Using fewer resources

Bio-based raw materials

Vesuvius uses and has used for many years eco-friendly or bio-based input materials in products including:

- Calcined waste from rice agriculture biomass
- Furfural and furfuryl alcohol from corn cobs biomass
- Sulphite lye/calcium lignosulphonate from paper manufacture waste
- Wood flour from wood waste
- Bioethanol-based solvents

10,050 tonnes

of bio-based raw materials were included in our products in 2024 (8,877 in 2023)

18.9%

of our revenue is from products including recycled materials

Reducing consumption

We believe that preserving the environment is good business. We strive to improve our material efficiency by reducing waste at source and during production, and minimising consumption.

Material waste

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

100% of our manufacturing sites report the various categories of waste and by-products they generate (waste coming from construction and demolition projects is not included, as it stems from exceptional projects and would distort the measure of progress in operations).

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).

Manufacturing sites have built action plans to eliminate, reduce and recycle covering both hazardous and non-hazardous waste. A wide range of actions have been initiated to reduce the amount of waste, such as closed conveyor and dust extraction systems, process improvements to reduce scrap and process waste generation, re-engineering of product recipes to include internally recycled material, and identification of recycling opportunities in other industries for by-products. Many sites have also implemented dry scrubbers, high-efficiency dust collectors and closed-loop systems to recirculate the dust captured in extractions systems; others are filtering wastewater in order to separate solids which will be reincorporated with the raw materials and water which is recirculated in the manufacturing process.

In 2024, the ratio of solid waste (hazardous and sent to landfill) per metric tonne of product packed for shipment reduced by 18% vs 2019, (2023: reduced by 10.2%).

In 2024, our manufacturing sites and R&D centres of excellence engaged in many activities to improve the handling of waste and reduce its quantity:

- 46 had mapped their waste streams
- 40 recovered and treated hydraulic fluids or oil waste
- 50 recovered at least part of the process waste and scrap to reuse it in products
- 61 were segregating waste for ease of disposal

More than 7,000 employees and directly supervised contractors received training on waste reduction and sorting.

In January 2023, an incident incapacitated one of our rotary kilns used in the production of dolime. As a consequence, the tonnage of dolime produced in 2023 was considerably lower, and the Group's product mix was very different to prior years. The dolime installation resumed production in 2024 albeit at a lower level than prior to the 2023 incident. The Group's waste reduction ratios are therefore affected by the lower output of dolime and performance improvement.

Using fewer resources

As performance comparisons with 2022 and prior years are therefore not meaningful when considering Vesuvius' operations, we have reported our waste ratios and performance improvement metrics in two ways:

- Covering 100% of Vesuvius' operations, as this offers the complete view of Vesuvius emissions (absolute and relative)
- Pro forma: performance as if the dolime process had been operating normally in 2024 (based on average production levels for 2019-2022).

Recycled material usage^{1,2,3,4}

	2024 Pro forma	2024	2023 Pro forma	2023	2022	2021	2020	2019
Amount of recycled materials used in Vesuvius products (metric tonnes)	69,255		65,734	64,477	74,501	58,426	70,299	
Amount of recovered materials that are not recycled used in Vesuvius products (metric tonnes) ³	0		0	0	0	0	0	0
Percentage of recycled materials in Vesuvius products from total materials	6.0%	6.5%	5.7%	6.6%	5.7%	5.8%	5.5%	5.9%
Percentage of revenue from products including recycled materials	18.9%		20.7%	20.4%	21.0%	19.6%	18.7%	

1. Re-baselined using pre-acquisition data for the business acquired from Universal Refractories, Inc. (Vesuvius Penn Corporation) and BMC (Yingkou YingWei Magnesium Co., Ltd) from 2019 onwards.

2. The numbers are collated from entities within the Group's Operational Control Boundary.

3. All recovered materials undergo some processing before their usage in our products. Therefore, they are all included in the recycled materials category, and the recovered materials category is empty.

4. Pro forma: performance as if the dolime process had been operating normally throughout 2023 and 2024.

Raw materials and waste

Manufacturing site raw materials & waste/(metric tonnes) ¹	2024 Pro forma vs 2019 %	2024 Actual vs 2019 %	2024 Pro forma	2024 Actual	2023 Pro forma	2023	2022	2021	2020	2019
Ratio of solid waste and by-products in metric tonnes per tonne of product packed for shipment	-33.0%	-31.5%	0.055	0.056	0.073	0.064	0.073	0.058	0.069	0.082
Ratio of solid waste per tonne of product packed for shipment (in metric tonnes)	-21.7%	-18.0%	0.030	0.031	0.031	0.034	0.035	0.031	0.032	0.038
Ratio of by-products per tonne of product packed for shipment (in metric tonnes)	-42.7%	-43.0%	0.025	0.025	0.042	0.030	0.038	0.027	0.037	0.044

1. Re-baselined using pre-acquisition data for the business acquired from Universal Refractories, Inc. (Vesuvius Penn Corporation) and BMC (Yingkou YingWei Magnesium Co., Ltd) from 2019 onwards.

2. Pro forma: performance as if the dolime process had been operating normally throughout 2023 and 2024.

3. The numbers are collated from entities within the Group's Operational Control Boundary.



For additional details on raw materials, waste and water, see Further information

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Using fewer resources

Hazardous and toxic waste

We are committed to the reduction of toxic and other hazardous waste. No Persistent Organic Pollutants are used in our products.

Whenever relevant, action plans to reduce hazardous waste are incorporated by manufacturing sites into their solid waste reduction action plans.

Manufacturing sites ensure that hazardous and toxic materials, and waste, are stored in protected containers and kept in delineated storage areas, with sufficient retention capability to prevent any release in case of accidental spillage.

Where we handle hazardous or toxic substances, employees receive specific training on how to handle them. In 2024, more than 4,700 employees and directly supervised contractors in 49 sites participated in such training sessions.

Specific procedures are implemented to ensure the specialised treatment and safe disposal of hazardous and toxic waste.

A variety of initiatives have been launched to reduce the amount of hazardous and toxic waste generated.

In 2023, we started studying industrial application opportunities for some of our waste, converting it into a value-adding product for customers.

In 2024, 39 manufacturing sites reported generating hazardous waste (2023: 41) and three reported generating toxic waste (2023: two). In 2024, 16.4% of our solid waste (excluding recycled waste) was classified as hazardous (2023: 15.8%), whilst toxic waste represents 0.093% of solid waste (excluding recycled waste) (2023: 0.078%).

By the end of 2024, 41 of our manufacturing sites and R&D centres of excellence had defined emergency plans including provisions relating to toxic and hazardous waste and materials. 26 tested them through simulation exercises in 2024.

21.7%

Reduction of solid waste (hazardous and sent to landfill) per metric tonne of product packed for shipment from 2019 to 2024 (pro forma)

Water consumption

We aim to reduce both the amount of fresh water consumed in our manufacturing process and social water consumption. The main area of focus is the reduction of wastewater. Vesuvius works to reduce the consumption of water in its manufacturing operations by recycling and improving water management processes. No salt water or cooling water is abstracted, with no related outflow. No water is used in our processes to quench or cool products. Various technological solutions have been implemented to reduce our water consumption and wastewater.

Most noteworthy, in the past five years:

- 30 sites have implemented measures to minimise water consumption in grinding, cleaning, degreasing and rinsing processes
- 15 sites have upgraded technology or equipment to significantly reduce water consumption
- 8 sites have implemented rainwater harvesting systems

Other examples of solutions to reduce water consumption include the use of high-pressure rinse pumps for the cleaning of batching tanks, water dosing systems, water treatment and recirculation. A typical example is the cleaning and closed loop recirculation of the cooling water used in grinding machines. Dry filter installations for particulate removal also allow for lower water consumption than wet scrubbers.

In 2024, total water consumption was 662,967 cubic metres or 663 megalitres. 642 thousand metric tonnes (96.9%) were consumed in our manufacturing sites, the remaining 20 thousand tonnes (3.1%) in our R&D centres of excellence, offices and warehouses. 33,500 metric tonnes were incorporated into our finished products ((5.1%) of total fresh water), the balance being consumed as part of our manufacturing processes and social water (94.9%).

In 2024, our overall freshwater consumption per tonne of product packed for shipment decreased by -17.5% vs our baseline of 2019. As with energy use, normalised consumption of water varies with product mix.



For additional details on raw materials, waste and water, see Further information

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Using fewer resources

Wastewater

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

We are focused on reducing water consumption and the volume of wastewater discharged. Manufacturing sites and R&D centres of excellence have implemented various technological solutions to reduce water consumption and the volume of wastewater discharged, covering the entire production process (from raw material mixing to finishing operations, including grinding, cleaning, degreasing...).

31 sites reclaim and reuse some water after usage and 15 sites have made investments in wastewater treatment installations. We have action plans in place to reduce our wastewater generation globally, including:

- Recovering and recirculating water after usage within the same process or another
- Investing in more water-efficient technologies such as replacing wet scrubbing systems for particulate removal with dry filter systems

- Optimising cleaning processes
- Detecting and addressing water leakages above and underground, and implementing preventative maintenance programmes
- Optimising production schedules to reduce the need for cleaning between recipes

In 2024, we completed the replacement of the wet scrubber, at the site with the largest discharge of wastewater, with a particulate removal system with a dry filter. The impact on the Group's wastewater performance has started to be seen in 2024.

Our wastewater performance has been adversely affected by investments in regenerative thermal oxidisers. Such installations allow far more efficient reduction of air emissions than water-based processes. As a result, wastewater which was formerly transformed into steam in the cleaning of air emissions is now released in liquid form and included in our wastewater emissions.

73% of manufacturing sites and R&D centres of excellence perform regular (at least annual) wastewater quality tests or monitoring.

Until 2023, not all sites had been including social water in the wastewater reporting. Social water is now included by all sites and past years' reports were updated to reflect this.

All wastewater is within regulatory permit limits. No substances of concern were recorded in 2024. Discharges in areas with water stress are not significant. All wastewater is discharged to municipal sewer systems.

	2024 Pro forma vs 2019 %	2024 Actual vs 2019 %	2024 Pro forma	2024 Actual	2023 Pro forma	2023	2022	2021	2020	2019
(Metric tonnes)										
Ratio of wastewater per tonne of product packed for shipment	-28.0%	-24.6%	0.222	0.233	0.269	0.292	0.290	0.285	0.305	0.309

Notes:

- Re-baselined using pre-acquisition data for the business acquired from Universal Refractories, Inc. (Vesuvius Penn Corporation) and BMC (Yingkou YingWei Magnesium Co.,Ltd) from 2019 onwards.
- Pro forma: performance as if the dolime process had been operating normally throughout 2023 and 2024
- The numbers are collated from entities within the Group's Operational Control Boundary.

Using fewer resources

Water stress

An assessment of all Vesuvius manufacturing sites was carried out using the Aqueduct Water Risk Atlas. 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 consumption of water.

Emissions into the air

Whilst measurements have confirmed that these do not represent a material topic, some Vesuvius manufacturing processes can lead to low levels of emissions into the air. These include post thermal treatment residual Volatile Organic Compounds (VOCs) (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.

Vesuvius' emissions of VOCs, residual GHGs and residual dusts are at levels too low to warrant any form of continuous measurement and reporting of quantities emitted, but manufacturing plants with identified potential exposure monitor their levels of emissions into the air through regular sampling, and actively work to reduce them.

Vesuvius is committed to working towards the complete elimination of emissions into the air. Various programmes have been developed over the years, including the upgrade of equipment to the best available technologies, and the implementation of filtration, vapour extraction and regenerative thermal oxidiser systems.

28.0%

Reduction of wastewater per metric tonne of product packed for shipment from 2019 to 2024 (pro forma)

The very limited footprint of Vesuvius' sites contributes significantly to limiting our Company's impact on biodiversity. We undertake routine surveys of all manufacturing sites and monitor the evolution of regulations related to biodiversity. We do not have any sites located within high conservation value areas, critical biodiversity areas or biodiversity-sensitive areas. Seven sites are located near (within approximately 1.5 km) of critical biodiversity areas or biodiversity-sensitive areas.

Biodiversity and greenery

As an integral part of its commitment to operate all work and business activities in a manner which ensures appropriate care and protection of the environment, Vesuvius is committed to not contribute to any net loss of biodiversity.

Biodiversity risk assessment of manufacturing and R&D sites (www.riskfilter.org)

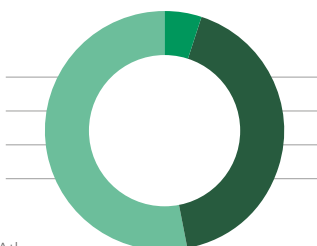
	Very low risk	Low risk	Medium risk	High risk	Very high risk
Environmental factors	0	36	17	1	0
Pressures on biodiversity	1	25	28	0	0

Location of manufacturing sites	Number of main manufacturing sites at the end of 2024	% of 2024 revenue
Very high water stress	4	5%
Moderate to high water stress	21	42%
Low to moderate water stress	29	53%

Notes:

- This data covers 100% of our manufacturing sites at the end of 2024.
- Water stress classification based on World Resources Institute Aqueduct Water Risk Atlas.
- Revenue from manufactured products.

The numbers are collated from entities within the Group's Operational Control Boundary.



For additional details on raw materials, waste and water, see Further information

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Using fewer resources

We have reviewed the location of all of our manufacturing and R&D sites against the WWF Biodiversity Risk Filter (www.riskfilter.org) to evaluate each site's exposure to:

- Environmental factors: protected/ conserved areas, key biodiversity areas, other important delineated areas, ecosystem condition and range rarity
- Pressures on biodiversity: land, freshwater and sea use change, tree cover loss, invasives, and pollution

We have not identified any biodiversity risks from our ongoing operations, other than accidental environmental releases and emissions into the air as detailed elsewhere in this report.

Actions have been taken in various manufacturing sites to increase greenery and biodiversity on their grounds and in neighbouring communities, including planting trees.

The Vesuvius Biodiversity Policy is available to view at: www.vesuvius.com.

Environmental monitoring and environmental regulation

Vesuvius operates sites in some developing markets where environmental concerns have become politically significant as air quality deteriorates, and residential expansion takes people closer to areas historically reserved for manufacturing.

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

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.

Environmental inspections and audits

Many of our sites are subject to routine audits and inspections by external authorities. Reports from external inspections, including those with findings, are centrally stored and shared internally with executive and senior management. In 2024, 54 external audits and inspections were recorded. Where local authorities carry out routine inspections, observations, recommendations and actions are recorded and acted upon appropriately, to prevent reoccurrence and continuously improve our environmental management systems.

Environmental issues are also within the scope of the Group Safety Audit. In 2024, 63 audits were conducted. Major findings are escalated to senior management, and action plans built to address them.



Using fewer resources

Environmental exceedances

Vesuvius is committed to addressing environmental exceedances and complying with local regulations. All exceedances are reported in a central database. Any significant exceedance or environmental incident is reported to the Group Executive Committee.

In 2024, Vesuvius recorded 82 mostly minor environmental incidents. Of these, 10 were related to emissions to the air and 72 to the ground. There were no emissions to water recorded in 2024. All 2024 reported releases to the ground were fully contained.

Three manufacturing sites were engaged in discussions with neighbours over environmental issues, mostly due to noise or smell. Four sites were engaged in discussions over minor environmental compliance issues with local authorities.

Total environmental releases across the Group in 2024 are estimated to have totalled 16.9 metric tonnes (including 13.8 metric tonnes of water-based materials) and 4.4 m³ of hydrocarbons, with the balance being solids and powders (2.6 metric tonnes).

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. Two regulatory actions issued in 2021 against Vesuvius in Belgium remain open; action plans to address these have been implemented. In 2024, we were notified of possible regulatory actions following one incident which occurred in the US in 2023, and for which remediation plans have been communicated to the authorities and should be completed before the end of 2025. Also in 2024, one of our sites in Australia was requested by authorities to undertake actions to ensure its compliance with local environmental regulations. Corrective actions were initiated, and progress is regularly communicated to the authorities. No action was taken by any authority in relation to an environmental incident in 2024 which resulted in financial penalties against Vesuvius.

Environmental management/certifications

External annual compliance audits are carried out primarily by the global assurance provider, LRQA. 100% of our ISO 14001: 2015 certifications cover the handling of waste and hazardous materials, including regular environmental impact audits and implemented risk prevention procedures (including emergency planning and testing).

8,877

employees and directly supervised contractors received environmental awareness training in 2024

Where previously the decision to pursue ISO 14001 certification was taken at a local level, Group policy is now for production sites representing c.95% of Vesuvius’ revenue from manufactured goods to seek ISO 14001 certification. Three production sites with no chemical materials are excluded.

We have 28 manufacturing sites certified to ISO 14001: 2015, representing 52% of sites controlled by Vesuvius and c.57% of revenue (office spaces, customer locations and warehouses are out of scope as waste and hazardous materials are not material at these locations). 59% of sites reporting hazardous and toxic waste, representing 69% of the hazardous and toxic waste tonnage, have ISO 14001: 2015 certifications.

A list of certified sites can be found on page 166. The current list may also be viewed on Vesuvius’ website.

(£m)	2024	2023	2022	2021	2020
Total cost of environmental fines and penalties levied	0	0	0	0	0

Using fewer resources

Environmental awareness training

Environmental protection requires efforts from all parts of society, including governments, companies and individuals. Vesuvius employees need to understand the main environmental risks in their site, and how to prevent and react in the case of an incident. We also believe that it is important to foster the right behaviours inside and outside the workplace. Environmental awareness training programmes are therefore being developed in many of our sites, covering a wide range of topics, such as:

- Types and sources of pollution
- Scope 1, 2 and 3 CO₂ emissions
- Vesuvius policies and procedures
- Different categories of waste and how they should be handled
- Good behaviours to adopt inside and outside the Company

In 2024, more than 8,870 employees and directly supervised contractors received environmental awareness training, lasting on average 2 hours.



Sustainability in action

Examples of our actions to reduce CO₂ emissions and energy intensity of our business

Carbon-free manufacturing plant in Brazil

The Rio de Janeiro plant **became carbon neutral in 2024** by replacing natural gas with biomethane (renewable fuel produced from organic waste) and switching to carbon-free electricity.

Reaching net zero CO₂e emissions by 2050 (Scope 1 and Scope 2) is one of Vesuvius' four priorities. The Brazilian team has already achieved this goal by taking advantage of the opportunities offered by the local infrastructure and by being extremely committed and focused on the target.

Outcomes

Greenhouse gas emissions reduction

100%



Energy Management System at the top level in Germany

Our plants in Borken and Großalmerode, Germany, were the first Vesuvius sites to obtain the ISO 50001 certification for their Energy Management System in 2024. Certification was the culmination of a great team effort, but the most important advantage of the system is **better transparency and control over energy consumption and procurement**. With the actionable data from the system, our Borken colleagues already optimised the energy consumption of the vacuum system in the feeding area.

This was done by renewing the pipework, replacing the motors and the electrical cabinet, and slightly reducing the vacuum pressure, which led to an electricity consumption reduction per tonne of product by 70% and helped cut CO₂ emissions related to that process.

Outcomes

Electricity consumption reduction

70%
per tonne of product





OUR CUSTOMERS

Our technology helps our customers improve the operational performance of their processes and their environmental footprint.

Supporting our customers' journey to net zero 68 >

Product safety and quality 73 >



Supporting our customers' journey to net zero

Vesuvius is committed to growing its contribution to a sustainable world, through products and services that improve safety, maximise environmental performance, reduce greenhouse gas emissions and contribute to the circular economy.

Innovation and Technology

Our products have the potential to help customers reduce and avoid greenhouse gas emissions when compared with their current practices, by amounts that far exceed the emissions required to manufacture and distribute them.

Our ongoing investment in R&D allows us to develop our technological leadership in, and support the evolution of, customers' needs.

Innovation and Technology risks and opportunities

Due diligence process

The Marketing and Technology organisations in each Business Unit are in charge of the continuous assessment of risks and opportunities related to Innovation and Technology. Inputs include a variety of sources:

- Monitoring the evolution of emerging technologies through our R&D network and technology partnerships, and the monitoring of industrial property claims
- Frequent interaction with our customers, via our sales organisation and meetings with R&D experts
- Regular participation in industry associations, trade shows and conferences
- Our network of product managers observing market trends

Risks and opportunities are assessed factoring in projected long-term market evolutions, value creation, competitive pressure and Vesuvius capabilities. These assessments are used to evaluate and adjust our R&D strategy, and orient new product development priorities in all main market and product segments. These are reviewed and discussed with the Group Executive Committee twice per year, and incorporated into the Board annual strategy reviews.

Main risks and opportunities

The challenge of decarbonising iron and steel-making, and aluminium smelting, will require the deployment of existing technologies such as Direct Iron Reduction and Electric Arc Furnaces on a very large scale and possibly the development of radically new technologies. Both existing and new iron and steel-making technologies will require refractory materials to handle liquid metal at very high temperatures.

More than 70% of our business in steel is in the steel casting part of the operation which, as a stand-alone process, is low CO₂ emitting (1% to 3% of a steel plant's CO₂ emissions), and which we do not expect to be affected by technology shifts that the decarbonisation of iron and steel-making will require.



Supporting our customers' journey to net zero

Whilst the electrification of light vehicles and ongoing light-weighting efforts are expected to translate into a shrinking of the market for certain iron castings, it is anticipated that this will be more than compensated for by the growth in other markets such as wind turbines and aluminium castings.

Changes in customer requirements driven by the evolution of their processes or downstream applications will occur over a very long period because of the long lifetime of their assets and large investments required to deploy new technologies.

Innovation and technology will affect the long-term growth or erosion of market share and profitability of our business. Gain or loss of technology leadership in key customer or product segments can be affected by:

- The adequacy of the investment in Research and Development
- The understanding of customer requirements and value drivers
- The success of new product development projects in meeting performance expectations
- The pace of adoption of new technologies by customers

Governance and operating controls

The Board oversees the Group's Innovation and Technology Strategy. The main Innovation and Technology performance figures are reported to the Board.

Responsibility for the elaboration of the Innovation and Technology Strategy lies with the Group Executive Committee. The Group and all Business Units integrate Innovation and Technology in their analyses and strategic plan presentations, which are presented to the Board every year.

The Group Executive Committee reviews each Business Unit's assessment of Innovation and Technology priorities as well as the progress of projects twice per year.

The Marketing and Technology organisations in each Business Unit are in charge of elaborating and driving the execution of the R&D strategy. They coordinate with the regional Business Units to organise the introduction of new products in the market and the commercial strategies.

Mitigating risks and driving improvements

Sustainable R&D

Vesuvius Group operates an extensive R&D network, located in six centres of excellence. The scope of work of the Group's central functions and R&D teams covers a wide range of activities including fundamental research and front-end innovation, new product development projects, the evaluation of alternative raw materials sources and support to operations.

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



Supporting our customers' journey to net zero

When designing new products, we look at our customers' current and future challenges, needs and expectations, combine this with information we have collected from our analysis of past issues, and seek to achieve both incremental improvements and breakthrough innovations in safety, robustness, reliability and performance to steer the development of next-generation products and services.

We complement our internal efforts with partnerships with over a dozen research institutions, universities and strategic customers, working to develop the refractory solutions that will support these novel processes.

Cooperation with customers

We actively cooperate with customers to help them evaluate the CO₂ emissions reduction our products bring to their complete value chain.

Our customers in the iron, steel and aluminium industries are embracing the challenge of dramatically reducing their CO₂ emissions. Many have pledged to reach net zero by 2050. They are investing heavily to transform their manufacturing technologies for the long term, working on a range of initiatives including the direct reduction of iron with carbon-free hydrogen and the replacement of carbon anodes in aluminium smelting.

We contribute to their efforts through technology partnerships and developing new products for the next generation of zero emissions aluminium, iron and steel-making processes.

Our products help customers improve the operational efficiency of their processes:

- Reduce heat loss
- Minimise casting temperature
- Extend production sequence length, and reduce downtime
- Increase metal yield in castings
- Reduce downgrading, remelting of scrap and repair of defects
- Improve metal performance
- Maximise casting speed and throughput
- Reduce and avoid greenhouse gas emissions

Benefits for customers can be measured in terms of:

- Reduced exposure to hot metal
- Reduced CO₂ emissions per tonne of metal cast
- Reduced consumption of refractory material per tonne of metal cast

- Improved metal yield (tonne of finished product per tonne of molten metal) and quality
- Improved metallurgical properties and consequently reduced metal consumption (e.g. vehicle light-weighting)

Product life cycle assessments/ assessing our portfolio

We have created a Product Sustainability Benefits Scorecard to evaluate the sustainability benefit of our products over their full product life cycle (raw materials, manufacturing, transportation, use phase and end of life), rating our products against standard market products. We rate our products based on their performance in relation to health and safety, environmental impact, greenhouse gas emissions and end-of-life processing. All criteria are assigned a weighting. In line with our objectives to reduce both our own CO₂ emissions and to help our customers reduce their CO₂ emissions, we give these criteria a significantly higher weighting. Our methodology also allows us to rate our products specifically on their superior performance in terms of CO₂ emissions.

Performing this analysis supports our objective to develop and supply products that provide our customers with a superior overall sustainability performance against the market standard.

We have formally integrated sustainability considerations into product R&D. Using the Product Sustainability Benefits Scorecard, we have undertaken a complete assessment of the pipeline of R&D and new product development projects, to check from the design stage that the projects are aligned with our sustainability ambitions and more specifically contributing to the fight against climate change by reducing CO₂ emissions. We use this information to adjust priorities and allocate resources.

We consider products that have better sustainability characteristics than those already on the market, to be 'market-leading sustainable products'.

Supporting our customers' journey to net zero

By the end of 2024, we had assessed 97% of our revenue from consumable products using this internal scorecard.

Product Sustainability Benefits Scorecard

Improves users' comfort, health and safety

Safety in manufacturing and transportation
Safety during usage
Exposure to health hazards

Limits our impact on natural resources

Product weight
Product lifetime
Recycled materials

Minimises energy consumption and emissions

Cradle to grave greenhouse gas emissions
Reduced and avoided CO₂ emissions for the customer
Volatile compounds emissions

Reduces waste, avoids landfill and increases recycling

Waste generation during manufacturing and usage
Recyclability after usage

Product Carbon Footprint

In 2023, we also started developing Product Carbon Footprint studies, in line with the principles of the ISO 14067 norm. Our goal will be to deploy Product Carbon Footprint studies to 100% of our product portfolio.

We championed the creation of a working group within the World Refractories Association to harmonise the methodology and assumptions for product carbon footprint studies across all companies within our industry. In 2024, the World Refractories Association organised a working group which Vesuvius has actively contributed to. This has led to the elaboration of a methodology and set of assumptions for the calculation of Product Carbon Footprints, common to the entire refractory industry. Vesuvius has started preparing Product Carbon Footprint calculations in line with this methodology.

Our progress

Our Technology and Innovation metrics and targets

Our goal is to increase New Product Sales as a percentage of Vesuvius sales. Our target is to reach 20% by 2026.

In order to achieve this target, we monitor our investment in R&D and proportion thereof that is dedicated to market-leading sustainable products. Our long-term objective is to reach 100% of such products in the development pipeline.

We also monitor the number of new product launches, and the proportion thereof that are market-leading sustainable products.

2024 Technology and Innovation performance

In 2024, the Group spent £10m, representing 29% of the Group's central functions and processes R&D spend, on the development of market-leading sustainable products (vs £12.4m, 34% in 2023). These constituted 67% of our New Product Development projects. £8.1m, representing 23% of the Group's central functions and processes R&D spend, was devoted to the development of products contributing to the fight against climate change by reducing CO₂ emissions.

19.1% of our 2024 sales were generated from new products.

17.6% of our 2024 sales were generated from products with superior sustainability characteristics (19.0% in 2023). 14.9% of 2024 sales were generated from products with superior performance in terms of customer CO₂ emissions. Our objective is to continue growing this share of our product portfolio year after year.

17.6%

of sales generated by market-leading sustainable products

Supporting our customers' journey to net zero

Vesuvius' investment in innovation and sustainability¹

	2024	2023	2022	2021
R&D spend	37	37	36	31
R&D spend dedicated to the development of market-leading sustainable products ²	10.0	12.4	8.1	9.7
%	29%	34%	23%	31%
R&D spend dedicated to the development of products contributing to the fight against climate change by reducing CO ₂ emissions ²	8.1	10.3		
%	23%	28%		

1. At constant 2024 currency.
 2. Using Vesuvius' internal scorecard.

67%

of ongoing new product development projects were dedicated to market-leading sustainable products

Looking forward

In 2025–2026, we plan to launch 52 new products (2024: 18), of which 33 (63%) will allow customers to achieve superior sustainability performance (2024: 33).



Product safety and quality

Customers rely on the quality of our products, and their structural integrity, to ensure the safety of their employees and operational performance and efficiency by controlling the flow of molten metal in their operations.

The reliability and performance of our products are critical to our customers in terms of safety on the shop floor, overall equipment effectiveness, labour productivity, cast metal quality and metal yield, and their environmental impact (reducing energy consumption, CO₂ emissions and refractory material waste).

Many of our products allow our customers to achieve improved metallurgical properties in their products, for example, allowing the production of better wind turbine components or the light-weighting of vehicles.

Due diligence process

Our ongoing monitoring of the performance of our products, including their safety and quality in use, develops deep and long-lasting relationships with our customers.

Product feedback

Our account managers are responsible for monitoring the performance of our products in use. After product launch, all incidents occurring at any of our customers that may have involved a Vesuvius product or service are systematically reported, documented and classified, based on their nature and severity. Safety-related issues (injuries or dangerous occurrences) are classified as Severity 1.

Each of our product managers is tasked with responsibility for collecting feedback on our products, driving investigations and managing improvements. Routine debriefing is organised after projects are completed. Field trial reports and incident reports are routinely reviewed to collect information on failures and improvement opportunities.

Main risks and opportunities

Product reliability most commonly affects the operational efficiency of our customers' processes (production stoppages, metal yield, scrap, cast metal properties). The reliability of our products is an important driver of our relationships with customers, along with our pricing and margins, and market share.

In extreme cases, product failures could lead to safety risks for employees at customer locations and damage to production equipment. Conversely, the Vesuvius product portfolio contains various systems designed to enhance safety (emergency devices wear monitoring systems, lifetime prediction models).

The Vesuvius product range is very wide (over 60,000 products) and highly customised to customer applications. Consequently, quality issues with a product or a customer are very unlikely to affect a significant number of other customers. The potential impact to the business, and to the overall customer base of any quality issue, is therefore limited.

Product safety and quality

Policy and governance

The Board oversees the Group's product safety and quality performance. Quality performance metrics are reported to the Board every month, including the number of customer complaints and repeat complaints. Details of high-severity complaints, including safety-related issues, are reviewed individually by the Board.

Responsibility for the safety and quality performance of our products lies with the Group Executive Committee. Product safety issues and quality performance are reported and discussed during each Group Executive Committee meeting.

Regional Business Unit management teams are responsible for the quality performance in their areas.

Risk mitigation and operational controls

As stated in our Quality Policy, we operate all work and business activities to ensure that the quality of our products and services consistently meets the requirements of our internal and external customers. We seek to be proactive in preventing customer issues, and to continuously improve our quality management systems and performance.

Product safety and 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 reviewed in detail during these meetings. Adverse trends result in prompt, clearly defined initiatives to permanently solve issues and prevent repeats.

We have implemented a wide range of practices to optimise the safety and quality performance of our products in use, reduce failures and increase the product's lifetime.

New product development

We follow a strict stage-gate process for the development of new products, ensuring that safety performance objectives are defined from the initial stages and progressively completed up to the product launch. Key deliverables include risk assessments, preparation of user and maintenance documentation, manufacturing control plans, and Vesuvius and customer operator training.

We undertake extensive testing through rigorous alpha and beta trials, with systematic trial reports to confirm that targeted performance and robustness objectives are met and to allow for fine-tuning before product launch. Safety data sheets are available for all consumable products.

Our automated and robotic systems are fully customised and embedded into our customers' processes. Their design and implementation require additional precautions to ensure optimum safety during the project phase and in operations.

Teams working on their development and installation at customers' sites therefore receive targeted safety training focused on the specific risks at various project stages.

The development of human-centred robotic solutions for steel shops reduces the ergonomic strain on our customers' operators together with their exposure to high temperatures. Development projects follow the ISO 10218-2 norm (safety requirements for industrial robots). External expert consultancy support is provided along with regular audits, and all follow the rules required for CE conformity or equivalent regulation.



Product safety and quality

Problem-solving

Regional Business Unit management teams are responsible for organising problem-solving teams to address issues and lead routine reviews of ongoing product safety and quality performance.

Our traceability systems cover 100% of manufacturing sites and products. As soon as Vesuvius is notified of any safety or quality issue, these allow immediate containment actions to be implemented. All suspicious products are quarantined, in our sites, in our warehouses and distribution channels, and at customer locations. If necessary, they can be recalled for investigation, rework or disposal.

Issues and incidents are dealt with through a rigorous problem-solving methodology and in-depth investigation using the 8D practical problem-solving methodology. This ensures we identify root causes, implement corrective actions and prevent them recurring. The outcome of the investigation, including root causes and corrective actions, is shared with the customer and lessons learned are incorporated into the design of following generations of products.

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, R&D and manufacturing experts, who work collaboratively to address the most challenging technical issues.

Whenever relevant, subsequent changes made to the design of products are deployed to installations in service at other customers and lessons learned are incorporated into the design of following generations of products.

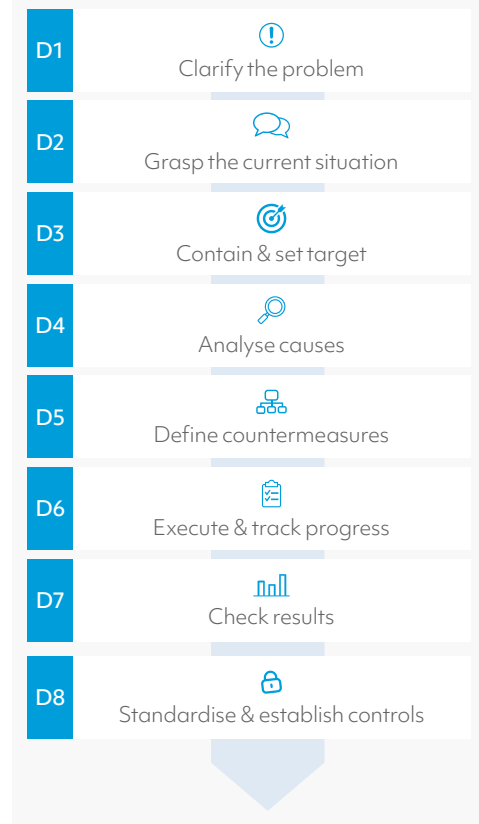
These processes allow us to learn from problems, provide feedback for the development of future products and constantly evolve and update our services in line with changing customer expectations and technological developments.

Training

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 appropriate corrective action is taken. The Group has developed its problem-solving capabilities through training and coaching in the correct use of the 8D practical problem-solving methodology. On a yearly basis, more than 2,000 problems are addressed using this technique.

Since 2020, to spread the quality breakthrough practices and tools, we have been continuously reinforcing our problem-solving capabilities. Their deployment has continued in 2024, with the reinforcing of our quality organisation and approximately 200 employees receiving the four-day 8D practical problem-solving training.

8D – The eight disciplines of practical problem-solving



Product safety and quality

Recognition

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.

In 2024, more than 100 projects were presented in the Regional 8D Competitions. In addition to recognising the best problem-solving and projects, these events are an opportunity to recognise talent and disseminate knowledge.

Regulatory compliance

Quality management system – ISO 9001 certification

Vesuvius places a high value on ISO 9001: 2015 certification and the business assurance that this quality management system brings. We have 72 certified Vesuvius and customer sites, employing quality professionals to maintain and develop quality systems under our Quality Policy. 100% of the management systems used to make our products are covered by ISO 9001: 2015. A current list of certified sites is available to view on the Vesuvius website: www.vesuvius.com.

99%

of Vesuvius manufactured products (by revenue) are covered by our ISO 9001: 2015 internationally certified quality management system

REACH regulation

For the development and production of consumable products, we have implemented an R&D screening of raw materials and chemicals to avoid introducing unwanted substances into the recipes and processes. Where potentially hazardous substances are nonetheless required, strict validation checklists have been defined to ensure adequate protection measures are taken at every step of the process. We document regulatory compliance through Safety Data Sheets for all raw materials consumed and all products manufactured, and share these with customers.

Our objective is to remain fully compliant with our registration obligations under the Registration, Evaluation, Authorisation and Restriction of Chemicals (REACH) regulation.

Since 2007, Vesuvius has appointed REACH managers for its Steel and Foundry Divisions, implementing an ongoing process to identify the REACH-impacted raw materials based on their Safety Data Sheets. These substances are then monitored throughout the production process in Vesuvius.

This also allows us to track the quantities consumed and verify that these remain within the limits of our registrations. Results are documented in a central database. We routinely organise training sessions for employees in the R&D, sales and purchasing organisations to ensure that any new substance included in a new product recipe or otherwise purchased, will be incorporated into our monitoring and registration process.

Updates to the lists of substances under REACH regulation issued by the European Chemicals Agency (ECHA) are continually reviewed and our internal monitoring adapted whenever necessary. Vesuvius also monitors projected changes to the list of substances under REACH regulation, to proactively incorporate future developments in our product development processes.

Whenever relevant, we also participate in the consultations led by ECHA to define the most appropriate status for substances.



Product safety and quality

We are undertaking a programme of formal assessments of our suppliers, with an objective to assess all relevant suppliers of raw materials. Since 2021, 270 suppliers have been contacted, of which 175 (65%) have already answered. All but three are already complying with the UK and EU REACH regulations or have initiated the registration process.

Following the UK’s departure from the EU in 2021, we adapted our registrations and purchasing organisation and systems to ensure that we remain fully compliant with our obligations both in the UK and EU.

Product safety and quality targets

Our goal is to reach zero product safety-related issues (injuries and dangerous occurrences).

We monitor the number of Customer Corrective Action Requests (CCARs), Severity 1 CCARs (safety-related incidents or quality issues affecting the customer of our customer) and repeat CCARs.

Product safety and quality targets are set by the Group Executive Committee on an annual basis.

Product safety and quality results

In 2024, one product failure was indirectly related to a customer employee injury (burns) resulting in a number of days away from work. Our teams recorded, reported and investigated 10 (2023: 22) customer health and safety-related issues with no injuries. Following these investigations corrective actions were implemented.

We were not notified of any non-compliance with regulations and/or voluntary codes concerning the health and safety impacts of products and services in 2024.

£m	2024	2023	2022	2021	2020	2019
Monetary losses incurred as a result of legal proceedings associated with defect- and safety-related incidents	0	0	0	0	0	0

The total amount of monetary losses incurred as a result of legal proceedings associated with defect- and safety-related incidents during the year was zero.



Sustainability in action

We help our customers to reduce CO₂ emissions: Solutions for Foundry customers

Redesigned gearbox casting system

Challenge

A European foundry wanted to reduce energy consumption, and improve workers' safety, whilst increasing productivity and maintaining its industry leadership.

Solution

Vesuvius redesigned the gearbox casting system's pattern, added special exothermic feeders and eliminated the need to use exothermic rising powders. This way, less metal is used in the process and the operators don't need to get so close to the hot metal. As a result, our customer improved safety and metal yield, reducing the amount of metal melted throughout the process by around 30%. Eventually, the foundry reduced time, energy and emissions whilst casting the gearboxes.

Outcomes

Operators' safety improved and customer CO₂e emissions are reduced by

21%



SEMCO coatings indicating the drying progress

Challenge

A customer wanted to reduce moisture-related defects and optimise the drying time and temperature.

Solution

SEMCO fast-drying and colour-change coatings cut drying times compared to traditional water-based coatings, resulting in lower energy consumption for drying, whilst optimising mould line productivity. These coatings include an indicator that shows the progress of the drying process by changing colour, allowing customers to avoid unnecessary heating and reduce energy consumption and carbon emissions associated with drying and rework.

Outcomes

20%

Energy savings reached and gas-related defects and rework can be eliminated



Sustainability in action

We help our customers to reduce CO₂ emissions: Solutions for Steel customers

Increasing refractory lining lifetime, increasing output and reducing CO₂ emissions intensity

Challenge

Our customer, an Electric Arc Furnace steel plant, wanted to optimise costs by extending their ladle refractory lining lifetime.

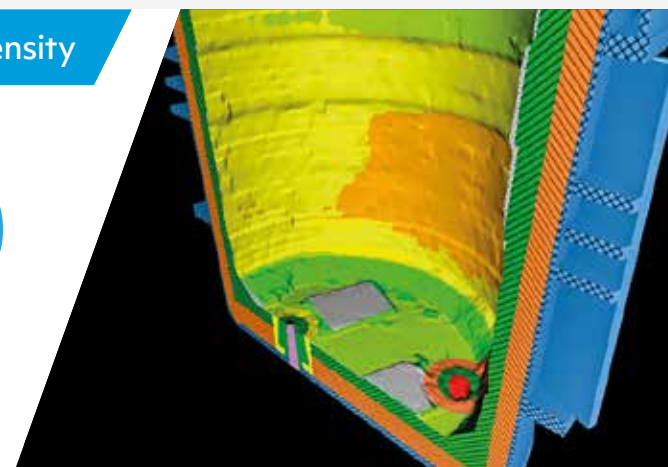
Solution

Our Process Metrix lasers allowed our customer to monitor the wear of their ladle refractory lining after each heat and determine how many more heats could be safely processed before repair or replacement was necessary. As the ladle fleet was the bottleneck of their production process, they could create further value by using wear measurement data to recalculate the available volume in each ladle after each heat, to maximise the quantity of steel per ladle.

Outcomes

6,500

tonnes of CO₂ saved per year thanks to energy efficiency improvements and lower consumption of refractory materials



Extending tundish sequence length with DuraSleeve*

Challenge

An Electric Arc Furnace steel plant, a single-strand Thin Slab caster, wanted to increase productivity and reduce carbon footprint by extending their casting sequence. One of the main factors limiting sequence length during the steel-making process is slagline erosion.

Solution

Vesuvius DuraSleeve technology reduces erosion of the slagline sleeve and extends the casting sequence length by 20%, generating energy and CO₂ savings out of the following factors:

- Lower energy consumption to preheat tundishes, caster metal yield improvement, less downgraded steel requiring remelting (Customer Scope 1&2)
- Lower consumption of tundish refractory materials (Customer Scope 3)

Outcomes

2,600

tonnes of CO₂ avoided per year





OUR PEOPLE

We provide our employees with a safe workplace, where they are recognised, developed and properly rewarded.

People and culture	81	➤
Human rights and industrial relations	88	➤
Health, safety and well-being at work	91	➤
Talent attraction and development	101	➤
Diversity and equality	106	➤



People and culture

Who we are

We are a global organisation with a diverse workforce of over 13,000 people of more than 70 nationalities across more than 40 countries. Our people are central to our success, and their expertise drives our innovation and operational excellence.

Our People and Culture Strategy aims to build an outstanding business by ensuring we have the individuals, skills and capabilities critical to the delivery of our strategy.

It focuses on delivering value for our businesses, a positive employee experience and functional excellence, through our culture of diversity and innovation. Our long-, mid- and short-term plans are organised around two key areas:

1

Building an outstanding business: with the critical skills and capabilities to win

2

Developing outstanding people: in diverse, engaged and high-performing teams

The underlying foundation for our People and Culture Strategy is our strong culture of delivering results in our diverse, entrepreneurial, decentralised organisation, where everyone is empowered to take action, working with like-minded people in a non-matrix environment.

Vesuvius is for ambitious, self-motivated people who thrive on challenges and solving problems. It is for people who are never satisfied, always raise the bar and dare to make difficult decisions and win.

Our strength comes from our CORE Values: Courage, Ownership, Respect and Energy. These Values guide and inspire us, shaping our behaviours and decisions.

Our principles and approach

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 global 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. We communicate openly and transparently within the organisation, through 'town hall' meetings, Board and senior management visits, management feedback, performance evaluation,

measuring employee 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.

We seek to foster a working environment that is inclusive and diverse, where people can be themselves without fear of harassment, bullying or discrimination.

Vesuvius workforce profile

Our workforce encompasses diverse professional disciplines that are vital to Vesuvius' operations, comprising engineering specialists, research and development professionals, manufacturing personnel, sales and procurement experts, technical support and customer service teams, along with other functions that support our business operations and provide continuity. In addition to permanent employees, we also employ directly supervised contractors mainly in our customer locations.



People and culture

A flexible workforce

Our activity levels fluctuate based on customer demand. A variety of measures have been implemented to ensure our workforce is equally flexible. These include the employment of agency workers, overtime and flexitime agreements, and suspended employment. A significant proportion of our headcount is employed in customer locations. The length of this employment with Vesuvius is dependent on the continuation or renewal of contracts. In many countries, we employ workers via professional agencies.

Whenever business is transferred by a customer from one supplier to another, this employment via agencies rather than direct employment provides workers with employment continuity, as it permits them to continue working for the customer whilst their services are transferred.

Headcount reporting

In Vesuvius, activity is not seasonal, so the year-end headcount figures included in this report are representative of the average headcount throughout the year.

In 2023 we changed the scope of our reporting of total headcount. We are now including directly supervised contractors based in customer locations.

Evolution of Vesuvius employees and directly supervised contractors – impact of change of reporting method

	2024	2023	2022	2021
Vesuvius employees	11,133	11,376	10,837	10,657
Directly supervised contractors – total	2,582	2,135	2,331	1,939
Vesuvius employees and directly supervised contractors (restated, new reporting method)	13,715	13,511	13,168	12,596

Notes:

In addition to the headcount figures above, Vesuvius used the services of 134 contractors and consultants in 2021, 222 in 2022, 166 in 2023, and 122 in 2024 to work on specific short-term projects.

Distribution of Vesuvius employees by category

	2024	2024 (%)
Vesuvius employees	11,133	81%
Directly supervised contractors	2,582	19%

Employee turnover in 2024 varied across our three regions: Americas, Asia-Pacific and EMEA. The headcount numbers reflect the diverse economic conditions and local market dynamics. In 2024, 1,838 employees left Vesuvius, which constitutes a rate of employee turnover of 17%.

Employee turnover in the Americas was primarily driven by job insecurity during US plant downsizing and technology transfers, while in Mexico, a combination of competitive market opportunities and internal challenges from rapid expansion and leadership changes contributed to workforce instability. Going forward, with a leaner team and stable leadership, employee turnover is expected to decline.

Permanent Vesuvius employee turnover per region

	2024 turnover (%)	2024 voluntary turnover (%)	2023 turnover (%)	2023 voluntary turnover (%)	2022 turnover (%)	2022 voluntary turnover (%)	2021 turnover (%)	2021 voluntary turnover (%)	2020 turnover (%)	2020 voluntary turnover (%)
Americas	26%	25%	24%	23%	20%	10%	20%	10%	18%	6%
Asia-Pacific	12%	12%	13%	13%	11%	9%	26%	14%	12%	10%
EMEA	14%	13%	10%	9%	11%	7%	12%	9%	14%	6%
Total	17%	16%	15%	15%	14%	9%	16%	11%	14%	7%

What matters to us

The safety and well-being of our people is our first priority. Over 80% of our employees and directly supervised contractors work in manufacturing environments. These roles involve interaction with machinery, industrial installations and high-temperature processes, posing inherent risks. For office-based employees, while exposure to physical risks is lower, their health, safety and well-being remain priorities. When analysing the impacts, risks and opportunities affecting our workforce, we considered employees as well as directly supervised contractors.

Our commitment to talent is fundamental to our success. We recognise that attracting, developing and retaining skilled professionals is crucial for maintaining our competitive edge and driving organisational performance.

We are committed to fostering a performance-driven culture where every employee can thrive, develop and grow while delivering excellence. Our culture is rooted in our CORE Values, which emphasise Courage, Ownership, Respect and Energy, leading to a valuable employee experience.

People and culture

Main risks and opportunities related to our workforce:

Risks:

– Employee safety:

The nature of manufacturing operations necessitates ongoing investments in safety measures and employee welfare.

Employees working in the sales organisation and customer service and support functions have higher exposure to road-traffic and business travel risks.

Employees and directly supervised contractors working in our plants are exposed to safety hazards common to all industrial companies including especially exposure to moving objects.

Employees and directly supervised contractors working in customer locations are additionally exposed to the specific hazards of foundries and steel plants, especially exposure to hot metal.

– Talent attraction and development:

Skills shortages caused by diminishing availability of graduates in fields such as engineering, metallurgy and materials science, particularly in Europe.

Declining demographics in key regions (EU27+UK, US, Japan) make it harder to find skilled labour, especially for physically demanding production roles. Decline of heavy manufacturing industries in some mature markets impacts the new generations' interest in pursuing their careers there.

– Employee well-being:

We recognise that working in a dynamic environment can expose our employees to stress which may influence overall well-being, both mentally and physically.

Opportunities:

– Workforce diversity:

Leveraging the diverse workforce across global talent markets (like Turkey, Mexico, Brazil, Poland and India) to foster innovation and creativity.

– Employer branding:

Refreshed employer brand provides a strategic opportunity to attract top talent and broaden industry appeal.

– Sustainability and accountability:

Developing talent with a focus on sustainability and fostering a strong culture of accountability to build a future-ready workforce.

– Automation:

Implementing automation to address demographic challenges, ensure operational efficiency and reduce reliance on physically demanding roles.



People and culture

Governance and policies

The Board is responsible for overseeing the culture and values of the organisation. The Group Executive Committee is responsible for setting and implementing the culture and values, including ethics-related matters.

Vesuvius' compliance policies are based on our CORE Values and Organisational principles. They underpin the behavioural rules 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.

Our CORE Values

The Group's CORE Values actively support 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.

In December 2024, the 2024 LTVA Winners were selected by the Senior Leadership Group, in a special online event broadcast to all employees. The Chief Executive, Patrick André, paid tribute to all the finalists, noting that they each provided a remarkable example of what can be achieved by being true to the CORE Values.

In 2024 the Global Living the Values Awards (LTVA) went to:

Global LTVA winner:	Global LTVA winner:	Global LTVA winner:	Global LTVA winner:
Courage	Ownership	Respect	Energy
Andre Frederici, Nestor Costa, Vanderson da Silva, Fabiano Moreira Advanced Refractories, Brazil The team led the commissioning of the first Vesuvius TSR robot in South America, which helped to secure high-quality service delivery to a key customer.	Rick Cario Advanced Refractories, USA Rick developed a mobile app which provides up-to-date product information to our field sales team, giving them a powerful selling tool at their fingertips.	Paulo Luiz Foundry, Brazil Paulo supports deaf operators, ensuring their safety and enabling them to work effectively by communicating with them in Brazilian Sign Language.	Aindrila Chakraborty Flow Control, India Aindrila supports recruitment and learning and development in our Indian business, and successfully hired over 120 new colleagues in 2023.

People and culture

Vesuvius CORE Values

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, and 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



People and culture

Our Organisational principles

At Vesuvius, we operate according to four fundamental Organisational principles that guide how we work, make decisions and achieve results across our global operations:

Decentralised – Whilst all our business leaders remain accountable for the activities of their jurisdictions, we empower all our staff to take ownership of their day-to-day decisions.

Entrepreneurial – In Vesuvius, we encourage all our staff to take the initiative, to identify business problems and proactively seek solutions.

Non-matrix – Our operations managers are empowered to make all decisions about their business. They consult with functional leaders but are ultimately fully accountable for their decisions.

Result oriented – Everyone at Vesuvius is focused on serving our customers and creating value for the business.

Our 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, suppliers, 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 eight key areas:

Eight key areas

1. Health, safety and the environment
2. Trading, customers, products and services
3. Anti-bribery and corruption
4. Employees and human rights
5. Disclosure and investors
6. Government, society and local communities
7. Conflict of interests
8. Competitors

Employee engagement

We aim to maintain the highest level of knowledge and understanding of all our stakeholders. We do this through internal and external reporting, and transparent and meaningful disclosure. Our Sustainability Report is a key part of this.

Vesuvius recognises that companies with highly engaged employees deliver better business outcomes. They have lower absenteeism, lower employee turnover, fewer safety incidents, better product quality, and higher productivity, sales and profitability. At Vesuvius, we regard engagement as critical to our ongoing success and we work hard to listen to our people and act when issues impacting engagement are identified.

We seek to understand and support all employees, including those who may be more vulnerable in the workplace by using anonymous methods of providing feedback such as our annual employee engagement survey – I-Engage and Speak Up. We measure the effectiveness of these tools by analysing response rates, tracking the percentage of employees participating each year and identifying trends in engagement across different departments and regions.

People and culture

Employee engagement is a collective responsibility, especially for our management teams. As a principal tool to help nurture this engagement, we have partnered with Mercer to undertake our annual I-Engage survey, which captures employees' perceptions and attitudes towards Vesuvius and their work. The survey results are compiled into team-specific reports, which managers discuss transparently with their teams. Together, they identify areas for improvement and develop practical action plans to deliver positive change to the work environment.

In 2024 as in 2023, we achieved an impressive 92% participation rate for the survey, thanks to the dedication of local management and a well-executed communication campaign. This high level of involvement provided valuable insights from employees who responded to 38 questions in the survey.

Our engagement metrics remained almost consistent with those seen for 2023, and highlighted similar key strengths, which were:

- Safety
- Employee Experience
- Company Purpose and Strategy
- Sustainability

While the scores for many key areas showed no change or a slight improvement, we recognise that there is still a significant amount of work to be done in this area. Vesuvius managers across the Group are committed to engaging their teams in purposeful conversations to ensure that we continue to make the Company a great place to work.

Internal communications

We continue to develop our internal communications programme to ensure we have a strong mix of channels to reach our diverse population. The Chief Executive regularly addresses the whole Group via Company-wide email and video, delivering strategic messages, and in 2024 held 12 interactive virtual sessions with the Senior Leadership Group to share business updates.

Company news and announcements are regularly shared on the Group intranet, whilst screen savers are used to support major communication campaigns. We also utilise posters and site 'town hall' meetings for on-site communications.

Whenever possible, face-to-face communication is conducted at different levels of the organisation, providing the necessary opportunities for interactive Q&A sessions with business leaders.



Human rights and industrial relations

Human rights and labour

The Group Human Rights and Labour 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. The Policy 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. The Policy was reviewed and updated in 2022.

Based on the geographic location of our manufacturing sites and our internal controls, we believe that no Vesuvius site is at significant risk of incidents of forced or compulsory labour. Vesuvius has implemented an internal audit system including Group Safety Audits, HR Sustainability surveys and a Speak Up whistleblowing process to systematically detect, manage and ensure the respect of human rights and labour rights across our operations.

In 2024, 15% of Vesuvius' operational sites – 19 sites in total – were assessed for human rights impact risks, and no breaches were identified. One of these inspections was external.

There were no human rights (child labour or forced labour) incidents reported via the Vesuvius Human Resources organisation or through the Speak Up whistleblowing process in 2024. The total amount of fines, penalties and compensation for damages as a result of incidents and complaints was nil.

Child labour and forced labour were included in the Group Safety Audit team's scope in 2024. These inspections are carried out on site. If any breach is suspected, the VP HSE is immediately informed for further investigation. All manufacturing sites are included within the scope of these audits, with an aim to audit them once per year. 63 audits were carried out in 2024 (2023: 67), with no breaches identified. 50 manufacturing and R&D sites (79%) and 13 customer locations were covered by these audits.

Working hours

In accordance with our Human Rights Policy, the Group seeks to ensure that workers do not exceed reasonable working hours to preserve their physical and mental health and safety. We are committed to the elimination of excessive working hours and respect local regulations on working hours in every country in which we operate. 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.

The verification of working hours is included in the scope of the Group Safety Audit. In 2024, verifications were carried out in 50 sites representing 88% of manufacturing and R&D locations, with no issues being reported.

Working conditions

Our organisation remains dedicated to ensuring that our workplaces are not only productive but also conducive to the well-being of our employees. In addition to respecting local labour legislation, we have introduced numerous family-friendly programmes, flexible working arrangements and healthcare programmes.

We recognise the importance of supporting our employees in their various life stages; examples of some specific programmes include parental leave, bonus allowance for childbirth, children's education monetary support, long-term service award, childcare support, and flexible work arrangements. 82% of our sites have implemented some form of working parent family-friendly programmes.

Human rights and industrial relations

Our employees are covered by public social protection against loss of income due to major life events or through benefits offered by Vesuvius except for some employees in India, South Africa and the US.

The health and well-being of our employees are paramount. In this regard, we have implemented various healthcare programmes worldwide, in addition to public systems, available for 98% of our employees. The range of benefits available includes services such as employee annual health check-ups including family, employee assistance programmes, medical mental health counselling, additional support including coverage of private medical healthcare, webinars and awareness sessions, to name a few.

From preventative care initiatives to mental health support, our commitment is to foster a culture of well-being in every aspect of our employees' lives.

Speak Up—the Vesuvius whistleblowing mechanism

In Vesuvius, we believe that 'doing the right thing' is as crucial to our business as 'doing things right'. We want to build our growth on the ethical principles which lie at the heart of our organisation. We promote a healthy Speak Up culture across the Group, with everyone playing an important part in raising concerns if they see things that aren't right in our business. The Speak Up process allows employees to escalate concerns on a range of issues when conventional channels have failed.

Vesuvius has introduced various types of channels for reporting violations including in-person or online options. Vesuvius provides a whistleblowing channel (Speak Up helpline) for all employees, customers and suppliers of the Group. This third-party operated confidential helpline is available 365 days per year, 24 hours per day, to anyone wishing to raise concerns anonymously or in situations where they feel unable to report directly. This independent facility supports online reporting through a web portal and reporting by phone.

To ensure global accessibility, employees can speak with operators in any one of our 29 functional languages. The Speak Up arrangement is overseen by the Board. Contact details are included in our Code of Conduct and are available on the internal and external Vesuvius websites. They are also communicated by local language posters in all our locations. We monitor the overall effectiveness of our Speak Up process and have observed an increased trust in this reporting method. This was reflected in the engagement survey conducted among employees (+8% compared to the previous year).

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 highlighted 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, as clearly stated in the Vesuvius Code of Conduct. Reports received via Speak Up channels are managed by the dedicated Ethics and Compliance team under the supervision of 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 lines where necessary, and 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. We acknowledge all cases within seven days and recognise that feedback to reporters is an important part of the process. Where possible we provide feedback on the outcome to the reporter following the conclusion of an investigation.

The Group monitors 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.

Human rights and industrial relations

During 2024, the Board 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. Further details on specific issues were provided where requested. In 2024, the Group received a total of 206 reports, of which 188 (91.3%) were submitted through the Speak Up facility and 18 (8.7%) were walk-in reports. Each one of these was reviewed and, where appropriate, investigated. In 2024, the average time from report registration to case closure was 69 days, which is in line with best practices for internal investigations, where cases are typically closed within 90 days. Similar to prior years, the majority of these reports related to HR issues, and business integrity and health and safety matters. These categories are further classified into subcategories, with the most common being General HR, Discrimination, Conflicts of Interest and Workplace Harassment. Of the small number of reports received that contained allegations of violations of our Code of Conduct, thorough investigations were carried out and, where appropriate, disciplinary action was taken.

Vesuvius supports freedom of association and the right to collective bargaining. Across all the countries where we operate, the Group engages with local works councils and trade unions, ensuring open communication on business matters as required. These regulated processes foster constructive dialogue between employee representatives and management, benefitting both our workforce and business operations. In 2024, 76% of our permanent employees were covered by Collective Agreements addressing key working conditions through local works councils, trade unions or other representative bodies.

Beyond local representation, Vesuvius also operates a European Works Council (EWC) with elected representatives from each EU country where we have employees. Following the UK's departure from the EU, the previous EWC Agreement was terminated, and after successful negotiations, a new agreement was finalised. The newly constituted EWC held its first meeting in November 2023, followed by a second meeting in June 2024, reinforcing our commitment to employee engagement at a European level.



Health, safety and well-being at work

Safety is our number one priority

Our safety management system covers all personnel, whether they are employees, contractors (directly supervised or not) and visitors.

Any tension between safety objectives and other objectives is promptly escalated and addressed by management.

Our employees are highly supportive of the Group's efforts to improve workplace safety and acknowledge how seriously we take this issue. In the 2024 I-Engage employee engagement survey, 86% of employees agreed that the Company would address safety concerns if they were raised, which was consistent with 2023.

Health and Safety Policy

The Health and Safety Policy is signed by all members of the Group Executive Committee and the Business Unit Presidents are responsible for its deployment.

Health and Safety Policy

Safety is our top priority 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.

We want to become a zero-accident company and are striving to become a best-in-class organisation for safety performance and leadership

- We will operate all work and business activities in a manner which ensures the physical and mental health and safety of employees, contractors, visitors, customers and any other persons affected by these activities
- We will comply with the legal health and safety obligations
- We will be proactive in preventing injuries and ill-health, and continuously improve our health and safety systems and performance

Organisation and responsibilities

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

- We will abide by simple and non-negotiable standards
- We will report transparently and 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
- Every business facility will follow the agreed health and safety plans, committing to reduce the frequency and severity of injuries, improve workstation ergonomics, prevent exposure to hazardous substances and minimise the risk of occupational diseases
- We will ensure awareness about health and safety issues and provide training for all new employees and contractors, and then at least annually, to ensure that they understand their responsibilities and are able to act accordingly
- Every business facility will have an appointed health and safety manager

Health, safety and well-being at work

Safety risks

Safety due diligence process

Vesuvius assessments of safety-related risks are updated annually via statistical analyses of Lost Time Injuries, covering the geographic distribution, nature of injuries, type of events, type of site and employee categories. They are complemented by the detailed investigation of all Lost Time Injuries. These are factored into the review of the main areas of attention and improvement plans.

Process safety incidents are rare, but potentially severe. A global assessment of Vesuvius' main processes factoring in risk levels and the number of installations was carried out to supplement the statistical evaluation of past events and individual review of all serious incidents, and select priority processes.

Main safety risks

The principal safety-related risks can be summarised by the following categories:

- Failures in safety leadership
- Inadequate identification of risks
- Insufficient or inadequate work procedures
- Insufficient training and supervision
- Individual behaviours
- Process failures

Main types of work-related injuries and safety risks

In 2024, the main causes of work-related injuries were, in descending order of frequency:

- Injured whilst handling, lifting, or carrying
- Contact with moving machinery
- Struck by a moving vehicle
- Fall from height (up to and including 2m)
- Exposure to or contact with a harmful substance
- Struck by moving, including flying/falling, object
- Strike against something fixed or stationary

The main injuries suffered were, in descending order of frequency:

- Fractures
- Contusions
- Sprains and strains
- Laceration, cut or open wound
- Dislocation
- Amputation

The main body parts affected were, in descending order of frequency:

- Wrists, hands and fingers
- Feet, ankles, knees and lower limbs
- Backs

Governance

The Board has overall responsibility for health and safety-related matters and delegates authority for the management of the health and safety performance of the business to the Chief Executive.

The Group VP Sustainability, HSE & Quality is responsible for setting the Group's policies for health and safety and controlling their application.

Business Unit Presidents and Regional Business Unit Vice Presidents are fully accountable for their safety performance. The Business Units are responsible for the implementation of these policies and are directly accountable for the health and safety performance of their operations, with each Business Unit determining its own priorities and resource allocations, aligned with Group-wide targets on safety performance.

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

Every Business Unit has a health and safety leader, and 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.

Health, safety and well-being at work

Health and safety governance

The Board

Overall responsibility for health and safety-related matters, approves targets

Chief Executive

Takes responsibility and is accountable for the safety performance of the Company, sets targets

Vice President Health and Safety

Defines standards, organises Group safety audits and benchmarks and guides strategy

Business Unit Presidents

Are responsible for resources, training, action plans and performance

Operating controls

Performance reporting and monitoring

Lost Time Injuries and Recordable Injuries are reported to senior management within 24 hours and recorded in a central database. Other safety-related metrics are reported every month.

The Board receives information on every Lost Time Injury (LTI) and key safety performance indicators every month. The Chief Executive also reports on safety performance and significant incidents at each Board meeting. In addition, the Board carries out a biannual review of health and safety performance and strategy. Annual presentations of Business Unit strategy include health and safety.

The results of our Group safety audits are presented to the Board twice per year.

Safety performance remains the priority item on the agenda at all our Group Executive Committee and management meetings. The Group Executive Committee reviews all the more serious health and safety incidents, including all LTIs, and the responses to these from local management.

Group safety audits

The Group operates a central safety auditing team of three auditors, each with more than ten years' experience, who report to the VP Sustainability. 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 2024, the team conducted 63 audits (2023: 66).

Following each audit, action plans are created by the site management teams to address any issues identified and work on completing these is assessed on a regular basis. The observations made during audits are used to improve the Group's training programmes and to enhance the Group's health and safety standards.

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

Learning from experience

Vesuvius operates a robust and comprehensive process for the timely reporting of incidents. We use more stringent definitions for LTIs and 'severe accidents' than the definitions used by many regulatory bodies. All sites are required to report on all Recordable Injuries (aligned with the OSHA definition), to maintain the focus on safety.

Dangerous Occurrences include all non-lost time and non-recordable injury incidents and incidents with and without actual damage, whether work-related or not. Since 2021, there has been renewed emphasis on the reporting of Dangerous Occurrences and injuries so that root cause analysis can be undertaken, and preventative action plans implemented to prevent future occurrences.

Any site experiencing a severe incident, an LTI a Recordable Injury, or a serious dangerous occurrence is required to investigate the incident. Vesuvius' investigation procedures are based on the 8D practical problem-solving methodology, 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.

The site then incorporates the findings into their site safety improvement plans and formalises the outcome of its incident investigation in a Lessons Learned Sheet, which is distributed through the Business Unit so that improvement actions can be cascaded throughout the organisation.

Health, safety and well-being at work

Mitigating risks and driving improvements

Measuring performance and building improvement plans

In addition to the deployment of Group Safety Standards, 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.

Every site management team receives a monthly dashboard of health and safety-related performance indicators, covering both lagging and leading metrics. 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 a behaviour-based approach to safety and the implementation of physical safeguards.

Based on the analysis of the type 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.

Main areas of action

Safety leadership and behaviours Executive Safety Tours

It is a requirement for all senior managers, irrespective of discipline, 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.

The tours encourage dialogue with staff, setting action points for discussion and implementation. In this way, these tours provide visible safety leadership on the shop floor in our sites and at our customer locations. Along with our daily safety audits, they are a central pillar of our Safety Breakthrough initiative.

2024 Executive Safety Tours

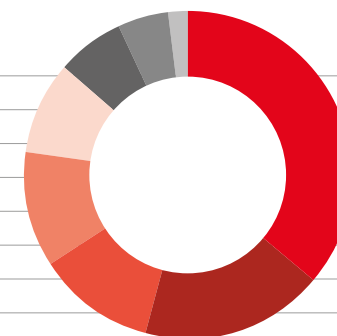
■ Europe:	64
■ NAFTA:	32
■ China:	21
■ South America:	20
■ North Asia:	16
■ India:	12
■ Australia and New Zealand:	9
■ Southeast Asia:	3

Total: 177

In 2024, 177 Executive Safety Tours were carried out by members of the Group Executive Committee and their direct reports (2023: 195).

177

Executive Safety Tours carried out by senior management (Group Executive Committee and their direct reports)



The number of Safety Tours conducted by middle management remained stable in 2024 at 1,170 (2023: 1,201) of which 212 were conducted at customer locations (2023: 252).

Health, safety and well-being at work

Safety audits and improvement opportunities

Safety audits are routinely carried out by all employees of Vesuvius and directly supervised contractors. Through this process of observation, identification of deviations and safety improvement opportunities and dialogue, we expect everyone to participate positively in the task of preserving workplace health and safety.

Safety audits are undertaken in Vesuvius sites and customer locations including both those where Vesuvius has employees and others where requested by customers, who recognise the benefit of a third-party perspective on safety.

In 2024, 82% (2023: 83%) of our working population performed routine safety audits every month. This generated an average of ten (2023: nine) implemented safety improvement opportunities per person, resulting in an improvement in worker safety. Actual safety improvement opportunity permanent actions (SIOPA) resulting in an improvement in worker safety count in 2024: 139,179 (2023: 128,235).

Safety days

In 2024, we organised our second Group-wide Safety Day. Events were organised in all our manufacturing sites, with more than 10,000 employees worldwide participating. The activities, which combined training, simulations, practices and hazard-hunting, were instrumental in strongly reinforcing the commitment to safety at all levels of the Company.

Employee participation in safety leadership

Employee participation in safety leadership is key. It is evidenced through the participation in regular safety audits, and involvement in joint management worker health and safety committees.

Nearly 10,000 Vesuvius employees in manufacturing sites and customer locations (representing 71% of the total workforce across all locations) were represented in formal joint management-worker health and safety committees in 2024.

82%

of all Vesuvius employees and directly supervised contractors participated in safety audits every month

Safety standards

Over the years, Vesuvius has developed a set of 44 Safety Policies and Standards. These are regularly reviewed and updated, based on the best practices implemented in sites and learnings from incident investigations. The Group Safety Audit checklist is designed to cover the essential points of the Group Safety Policies and Standards.

The list of Standards can be found in Further information on page 168.

CORE Safety Rules

In 2019, we launched the Vesuvius eight CORE Safety Rules that outline our employees' basic safety responsibilities. These were rolled out across the organisation as the mandated practices for employee and manager conduct. In conjunction with this, the Group has implemented procedures to ensure the rules are followed. The rules were incorporated into the contractual terms of all relevant employees, and all employees are expected to report breaches and violations of the rules, with appropriate sanctions imposed whenever required. Failure to do so is a disciplinary issue.

Eight CORE Safety Rules

- I always wear mandated personal protective equipment
- I only operate equipment or vehicles if trained and authorised
- I do not remove, bypass or tamper with machine guarding and safety devices
- I lock, tag and try before any intervention on a machine
- I make sure all high-risk activities are covered by a daily Permit to Work
- I always ensure my fall protection is secure before working at height
- Before entering a confined space, I check that I will be able to breathe and escape
- I only perform electrical work if certified and authorised

Health, safety and well-being at work

Risk assessments and high-risk activities

The identification of health and safety risks in operations is essential. We have developed a risk assessment standard, which applies to 100% of our manufacturing sites and customer locations. It covers the identification and rating of hazards, and the actions implemented to reduce risk levels. These include:

- Engineering solutions to eliminate or minimise risks
- Procedural measures, such as training and auditing
- Work instructions, written with the involvement of the employees who carry out the tasks, with illustrations and in local languages
- Providing personal protective equipment to employees free of charge

The deployment of the risk assessment standard is routinely audited during Group safety Audits. We routinely carry out risk assessments to identify and rate hazards and implement protective measures to minimise exposure.

Emergency preparedness

Using risk assessments as a basis to identify and rate possible risks, our manufacturing sites build procedures, covering a variety of incidents (injury, fire, weather events, earthquake etc.) and train teams to respond optimally in case of emergency. Emergency procedures are routinely tested via drills and exercises, sometimes organised jointly with the local fire departments.

Approximately 12% of Vesuvius employees are trained first aiders (to address injuries and health issues) and more than 22% are first responders (in case of fire, chemical spill, confined space rescue, foreseeable emergency scenarios).

Control of contractors

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 operating guidelines such as 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. The presence of all contractors on site is registered. All activities subject to a Permit to Work are audited on a daily basis.

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

Customer locations

In line with our safety priorities, 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.

Our Customer Location standard addresses the specific risks faced by our employees whilst operating in customer locations and applies to approximately 3,400 Vesuvius employees and directly supervised contractors worldwide. The standard focuses on structuring cooperation between our customers' management teams and our own to ensure health and safety 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. These are then formally included in the contractual conditions we impose when working at a customer site.

Health, safety and well-being at work

Housekeeping

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.

Process Safety

In 2020, Vesuvius launched a new Process Safety initiative, starting with an analysis of the history of the main process-related incidents, the identification and mapping of high-risk processes in the Company. This led to the elaboration of a global process safety framework.

A first technical standard covering high-pressure isostatic presses was written and deployed starting in 2021.

Our second process safety standard, covering dust and explosive powders, was deployed in 2022 and continued throughout 2023 and 2024.

Safety training

TurboS

Our proprietary TurboS training is a part of the Group's Safety Breakthrough initiative. It pulls together all of our safety management practices and includes a strong focus on the standardisation of all of 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.

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.

Group Safety Standards

We regard the understanding and application of the Group Safety Standards by management and all employees as essential to ensure their proper implementation on the shop floor and ongoing adherence. We therefore expect our managers to carry out compliance self-assessments for their sites based on the Group Safety Audit checklist and invest in the training of employees on the HSE standards.

In 2024, more than 11,000 Vesuvius employees (representing 81% of the total workforce) received more than 155,900 hours of training on safety standards, representing on average, more than 11 hours per person.

Other programmes

In addition to training on Group Safety Standards, Business Units and sites develop and offer safety leadership programmes (TurboS) and courses addressing the specific processes and risks. Communication and training on hand safety and ergonomic practices have been major areas of recent focus.

The list of safety training programmes can be found in Further information on page 169.

11

hours of safety training
per person in 2024



Health, safety and well-being at work

Occupational health and diseases

Occupational health and personal safety management are blended at all of our sites. The management of occupational health covers Vesuvius employees and directly supervised contractors equally.

In line with our CORE values, and our commitment to employee engagement, benefits including access to healthcare and medical support are managed locally in accordance with local laws.

Occupational health hazards are covered in risk assessments. All sites provide occupational health services that are relevant to hazards and risks to which employees and others are exposed (e.g. forklift drivers), such as routine health check-ups.

In addition, Vesuvius has developed and implemented a variety of programmes to ensure that we provide our employees with work conditions that are not detrimental to their health, and regularly improve them.

In addition to locally driven programmes, the Group has defined an Occupational Health standard, which specify the Group's requirements in terms of the monitoring of exposure and health checks. It standardises across the Group the frequency of controls, thresholds and required control measures. Based on the activities of the Group, priority is being given to noise, dust and Volatile Organic Compounds such as Furfural and Isopropyl Alcohol. The Occupational Health standard was rolled out in 2024.

Employee well-being

We recognise that ensuring the well-being of our employees goes beyond the provision of safe working conditions and the prevention of occupational diseases. In line with our decentralised Organisational principles, individual sites are encouraged to provide their staff with healthcare insurance, routine health checks, and additional mental health and well-being support.

In 2024, 98% of Vesuvius employees were covered by various healthcare programme (89% in 2023). 85% underwent a routine health check (78% in 2023). 65% of employees were entitled to take family-related leave; and 32% of women and 24% of men took family-related leave in 2024.

Various healthcare programmes were initiated or continued in many Vesuvius entities depending on local needs including:

- Mental resilience and work-life balance sessions
- Wellness and well-being programmes
- Life coaches for newly hired employees
- Mental Health First Aiders programme
- Stress management lectures
- Flexible working arrangements
- Occasional leave opportunities to cope with various personal situations, special health insurance

71%

of the total workforce are represented by formal joint management-worker health and safety committees

Our progress

Our safety targets

Our long-term objective is to become a zero-accident company. This ambition applies to all employees (permanent and temporary), contractors and visitors.

The Lost Time Injury Frequency Rate (LTIFR) Target is set by the Group Executive Committee. This target covers 100% of operations and includes employees, contractors and visitors (and is the same for all categories). It is established considering past year performance and long-term objectives.

The Group's 2024 LTIFR target was set at less than 0.8 per million hours worked. Having outperformed our target since 2023, we have set ourselves a stretch goal of 0.5 by the end of 2025.

In 2025, we intend to set a LTIFR target for 2030, which will be submitted for the Board's approval.

Health, safety and well-being at work

2024 safety performance

Our LTIFR of 0.52 per million hours worked in 2024 was lower than 2023 (0.60), but we recognise that there is more work left to do. The LTIFR for not directly supervised contractors and visitors was 0 in 2024 (2023: 1.6).

Fatalities and severe injuries

There were no work-related fatalities in 2024. During 2024, one employee suffered a finger amputation (during the handling of a 1 tonne bag of material) and three suffered injuries requiring surgery and hospital stays. We are actively taking steps to learn from these severe injuries and to improve our systems and procedures to prevent any similar occurrences.

0.52

Lost Time Injuries per million hours worked

In 2024, 16 LTIs were reported (2023: 17) which resulted in 794 lost days (2023: 1,372) giving the LTI frequency rate for the year of 0.52 (2023: 0.60) per million hours, and a severity frequency rate of 26 days lost per million hours (2023: 49). In 2024, 56 Recordable injuries were reported (2023: 96), resulting in a Total Recordable Injury Frequency Rate of 1.8 (2023: 3.4) per million hours. Vesuvius includes not directly supervised contractors and visitors (2024: 898, 2023: 696) in reporting.

Performance indicators	Employees and directly supervised contractors	Not directly supervised contractors and visitors	All employees, not directly supervised contractors and visitors
Work-related deaths	0	0	0
Severe injuries	4	0	4
Lost Time Injuries (LTIs)	16	0	16
LTI Frequency Rate (LTIFR) per million hours	0.56	0	0.52
Total Recordable Injuries (TRIs)	56	0	56
Total Recordable Frequency Rate (TRFR) per million hours	2.0	0	1.8
Safety audits (number)	142,050	0	142,050
Safety audits per 20 employees per month	17	0	17

Whilst 2020–2022 were unusual years because of the COVID-19 pandemic and associated changes in working, we believe that the long-term improvements, including the significant improvement in 2023 and 2024 in the LTI frequency rate, reflect a broader trend of underlying improvement for the Group and result from a strong management commitment to change. Shifting the focus to the globally recognised OSHA Recordables for medically treated injuries supports the continued downward pressure on frequency rates.

As the focus on Dangerous Occurrences has grown, so has the number of Dangerous Occurrences reported. In 2024 these increased to 3,776 (2023: 2,925).

Serious Dangerous Occurrences that could have resulted in a severe accident require investigation via a full 8D report, the rest are dealt with via the Practical Problem-Solving line.

Looking forward

We are determined to continue our journey to zero accidents. Learning from past incidents, we will continue focusing on two pillars:

People development and behaviours

- Training and auditing
- CORE Safety Rules
- Safety days
- Equipment and activities
- Lifting and handling
- Machine guarding and safe procedures
- Process safety

ISO 45001: 2018 certification

Vesuvius sites choose to certify based on local management priorities, regulatory and customer requirements.

Nine manufacturing sites (representing 16.7% of our manufacturing sites), one warehouse and three Vesuvius operations located at a customer site, are certified to ISO 45001: 2018, covering 13% of Vesuvius' employees and directly supervised contractors. A current list of certified sites is available on the Vesuvius website.



For additional details on our safety performance, see Further information

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Health, safety and well-being at work



Safety awards and recognition

In addition to our efforts to keep our employees and contractors safe, we take pride in sharing our safety management practices with our customers. We are very proud of the external recognition received by our teams for their safety leadership and achievements. Some of the awards received in 2024 included:

► Chemical control award

Aichi Safety Association awarded to the Vesuvius Japan team for their robust control of chemicals.

► Best industrial practices

Vesuvius team from India was recognised by the Confederation of Indian industry for best Industrial practices

► Leadership in safe workplace organisation

Vesuvius manufacturing site in Poland won the title of the 'Employer – safe work organiser' by the State Labour Inspection.

► Customer recognition for safety practices

Vesuvius customers such as Ternium Brazil, Tata steel, ArcelorMittal Nippon Steel India, JSW Vijayanagar and China Steel recognised Vesuvius as a supplier and partner with the highest safety standards.


► Vesuvius Safety Awards

14 districts granted Safety Awards

Vesuvius has also created internal Safety Awards, to recognise its best performing locations. In 2024, 14 of the 44 districts were awarded Safety Awards as recognition of their outstanding safety performance in the previous year. These regions had each completed the year without any LTIs, recorded a participation of more than 80% of employees in monthly Safety Audits and implemented more than ten improvement opportunities per person per year.



For additional details on our safety performance, see Further information

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Talent attraction and development

At Vesuvius, talent attraction and development lie at the heart of our strategic approach to staying competitive in a rapidly evolving global manufacturing landscape. We recognise that a balanced mix of high-quality external talent and a strong internal talent pipeline, combined with continuous development, is essential to driving long-term success.

To meet this challenge head-on, we have implemented a series of proactive initiatives designed to both attract and nurture the right talent. Our talent strategy is centred on identifying potential risks and uncovering opportunities in talent acquisition and development. We are continuously enhancing our employee experience, ensuring that our people not only thrive in their roles but are also positioned for future growth. This includes crafting clear, well-defined success profiles for each role, utilising multiple rounds of assessments, interviews, psychometric assessments and reference checks. Measuring the effectiveness of policies and action plans to secure top-tier talent, and launching a newly refreshed employer brand to strengthen our position in the market.

Internally, we have developed a robust system for tracking and evaluating performance effectiveness across all

levels. This includes two comprehensive, Company-wide system-based performance processes: one focused on an overall performance review, where managers assess employees on key factors such as alignment with Vesuvius CORE Values, achievement of results and role-specific competencies; the second on reviewing year-end personal objectives, which are linked to individual goal achievement and career progression. In addition, we hold mid-year performance reviews to ensure alignment, address any gaps and refine development plans for the remainder of the year. These processes are vital in identifying skill gaps, talent risks and opportunities for growth, enabling us to take corrective action where needed.

To mitigate talent risks and ensure a steady flow of high-quality leaders, we regularly conduct business-specific talent reviews (including the performance potential grid), and incorporate work shadowing, 360-degree feedback, coaching and mentoring, cross-cultural training, and conduct individual/team development programmes. These efforts enable us to continuously develop our internal talent pool while strengthening our leadership pipeline.

Despite these robust efforts, we face several challenges in attracting talent,

especially among women, which is common for many companies operating in heavy duty and engineering industries. We remain far from our ambition to reach 25% gender diversity in the Senior Leadership Group (representing c.150 of the company's most senior managers) by the end of 2025. To meet this challenge, we are placing greater emphasis on developing an internal pipeline of female talent. We are also seeking to improve gender diversity throughout the organisation, and we encourage managers to leverage our decentralised entrepreneurial culture to drive programmes suited to local needs and improved succession planning processes. By continually refining and executing on our talent strategy, we are overcoming these challenges and steadily improving our position in an increasingly competitive global talent market.

Talent management

The Group Executive Committee holds direct responsibility for the roles and development of our senior leaders, jointly reviewing capability needs and deciding on succession and cross-organisational moves for the leadership group. This illustrates the strong commitment at the highest level of our organisation to 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 diverse backgrounds and experiences to our daily work.

Leadership pipeline

Strengthening the leadership pipeline and facilitating people development throughout the organisation remain key areas of focus for Vesuvius. We continue 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 aim to adopt a balance between external hires and internal promotions, fuelled by a strong process of backup and succession planning, especially for management positions.

Talent attraction and development

Training and development

In 2024, a total of 133,742 hours of training were delivered across the organisation, which included 15,580 hours for female employees and 118,162 hours for male employees. On average, this translates to 10 hours of training per female employee and 13 hours per male employee. The difference in training hours can be primarily attributed to the higher number of male employees in shop floor activities, which typically require more training hours and where there are fewer female positions compared to other areas of the business.

Every employee at Vesuvius has access to a series of mandatory e-learning modules on our intranet – Horizon. This includes three levels of product training modules called HeaTt. In addition, we have many mandatory country level learning programmes such as Anti-Bribery and Corruption compliance, data protection and cyber security training. We also provide a variety of career and skills development training programmes for our commercial and manufacturing teams in particular. For Managerial jobs, we have tailored individual internal and external programmes.

In 2024, personal development plans were in place for 292 female and 1,502 male Vesuvius permanent employees. Personal development plans are tailored plans designed to accelerate an employee's growth and development.

They provide a structured approach to enhancing skills, improving performance and supporting career progression in a meaningful way.

35% of Vesuvius employees received skills-related development training in 2024.

During the course of our activities, we may collect, store and process personal data about our staff, customers, suppliers and other third parties, and our Data Protection Policy recognises our commitment to treating this data in an appropriate and compliant manner. Specific data protection training through e-learning is a mandatory training course for all employees with email access.

Global mentoring programme

In 2024, Vesuvius continued its global mentoring programme for its top talent focusing on leadership and talent development. There are currently 23 mentees taking part in the 12-month programme, of which nine are women. Mentees learn from the experience and perspectives of a senior leader, including members of the Group Executive Committee with an individual personal development plan created to enhance their careers and leadership capabilities. The programme ensures internal knowledge transfer and builds a broader, deeper and readily available talent pool.

Technical training

Our internal HeaTt training is 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 and delivery methods, 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. The first introductory module is mandatory for all new employees and is available online on our HR information system, allowing participants to access learning at anytime, anywhere. In 2024, 734 employees completed this first module online.

HeaTt Module 2, Iron & Steel, was launched on our HR information system in October 2022, comprising 23 chapters of training material. The course is divided into three sections; the first explains the process of producing iron and steel, the second explains the different refractory products and the third section details how these products are applied in the iron and steel manufacturing processes. Module 2 encompasses products from Advanced Refractories, Flow Control, and Sensors & Probes.

This module is open to every employee. In 2024, 125 employees went through the whole three sections of this Module 2.



Talent attraction and development

There are several online HeaTt M3 modules for Flow Control. They are organised by product line and are much more technical. Customer-facing and Marketing and Technologies employees are enrolled based on their technical needs. In 2024, people who completed the modules that were assigned to them spent over 5,552 hours on M3 training.

Commercial Excellence programme

We have undertaken the ambitious task of upskilling our sales teams (400+ employees) in the Steel Division through a comprehensive six-month blended training programme known as ComPro2.0. The primary objective of this programme is to elevate sales effectiveness by focusing on value selling methodologies. By equipping our salesforce with advanced techniques and strategies, we aim to generate better top-line results for our business, better partnerships with existing clients and increase new client relationships, thus improving our market competitiveness. Additionally, this initiative aims to empower our sales teams with the knowledge and skills necessary to navigate and excel in competitive market landscapes.

Compliance training

During the year, we continued to embed our training portfolio. This is based on the principles contained in the Vesuvius Code of Conduct and associated anti-bribery, corruption and other compliance policies and procedures.

Compliance 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 employee to respond to those risks.

Compliance training provided in 2024 included:

- An annual mandatory e-learning module for anti-bribery and corruption, available in 22 of our functional languages for targeted staff, which is linked to the Vesuvius AB&C Policy
- Webinar and face-to-face training provided by the Compliance team to staff at several sites covering anti-bribery and corruption, the Speak Up Policy and trade sanctions
- Updated face-to-face training made available for senior management on the overall compliance framework and process for policy and procedure implementation and monitoring

- New senior manager compliance induction training – new senior leaders receive dedicated training from the Compliance team. This induction contains training and guidance on all relevant Compliance policies and procedures, and further explains to participants their role in effective risk management

The Board has set a target of at least 90% of targeted staff completing the annual anti-bribery and corruption training. 4,584 employees, representing 100% of the targeted full- and part-time Vesuvius employees, completed the 2024 anti-bribery and corruption training.

Mandatory online training courses – 2024 participation	% of targeted audience completing course
Anti-Bribery and Corruption (annual)	100%
Gifts, Hospitality and Entertainment (onboarding)	96%
Modern Slavery	95%
Anti-Tax Evasion	100%
Data Protection	97%
Cyber Security Awareness – 7 Basic Modules	90%
Total training hours	8,156.80

100%

of the targeted staff of the total full- and part-time Vesuvius employees, completed the 2024 anti-bribery and corruption training



Talent attraction and development

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 systems and processes are designed to create a market-competitive and rewarding 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', annual 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, market-leading evaluation methodology, enables us to compare roles and ensure internal consistency throughout the organisation.

We are committed to operate 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 Plan (AIP) is measured against both Vesuvius' financial targets and personal performance, an incentive structure consistent with that of our Executive Directors. Eligibility for participation is based on job grade and role in the organisation. Managers are rewarded for company performance (80%) and personal performance (20%). In addition, 58% of these employees participate in a share-based incentive plan.

The Vesuvius Share Plan for Executive Directors and Group Executive Committee members encourages robust decision-making based on long-term goals rather than short-term gains and works to align the interests of participants with those of shareholders.

In 2024, 100% of our salaried permanent employees participated in an annual performance review (26% female, 74% male). This compared with 99% in 2023, 98% in 2022, 93% in 2021, 95% in 2020 and 92% in 2019.

More than half of Vesuvius' permanent employees worldwide, both salaried and hourly, have a variable performance-based component to their pay through various local incentive schemes.

Non-compensation benefits including retirement benefits are managed locally in accordance with local laws.

100%

of Vesuvius' permanent salaried employees participated in annual performance review



Talent attraction and development

Global mobility

Vesuvius operates worldwide. We believe that our global operations 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.

International assignees do not come from one or two countries alone. We have a truly international mix of nationalities in our mobile population. Individuals move not only within a region, but also between regions. Our mobility programme shows that our assignee population is as diverse as our Group.

Vesuvius operates international assignment policies which support the varying nature and circumstances of these assignments – whether they be short-term, longer-term or require extended commuting. In addition, we do actively support, where appropriate, localisation of employees upon international assignment and provide comprehensive support to aid integration, settlement and localisation in the new country. These policies are supplemented with clearly identified benefits, delivering support appropriate to the nature of the assignment. We manage international assignments with flexibility, catering to changing expectations and demands from employees, whilst meeting the needs of the business at the same time.

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 or developing our presence. The number of assignees working on this basis diminishes over time as the organisation matures and we recruit, train and develop local talent to step into management positions.

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 support this goal.

Talent and know-how retention

Excessive staff turnover and loss of know-how represents a risk to the business. Actions have been implemented across the Company to identify and seek to mitigate this specific risk. Most notably, all entities routinely monitor their turnover to detect any issues and exit interviews are conducted to understand the reasons that people leave our Company. In addition to the specific actions defined locally, Company-wide processes help identify and mitigate the risks of excessive staff turnover. As part of the annual people review process, all key personnel are assessed for career development opportunities, risk of resignation, succession planning and backup. Individual development plans are discussed and developed so the Company can enjoy a healthy pipeline of talent.

Diversity and equality

As an organisation, Vesuvius has a global, multicultural operational and customer base, which we wish to reflect inside our organisation with a multicultural, diverse community of excellent professionals from all backgrounds. This starts by focusing on broad diversity of gender and nationality, with an aim to ensure that all employees and job applicants are given equal opportunity and that our organisation is representative of all sections of society where we operate. Vesuvius operates in 40 countries around the world, employing people with more than 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.

While we are absolutely determined not to accept any form of negative discrimination, it is not our policy to engage in any positive action or preferential treatment.

Vesuvius' Diversity and Equality Policy

We are dedicated to encouraging a supportive and inclusive culture amongst our global workforces.

We aim to ensure that all employees and job applicants are given equal opportunity and that our organisation is representative of all sections of society where we operate. Each employee will be respected and valued and able to give their best as a result.

We are committed to providing equality and fairness to all in our employment and not providing less favourable reward, facilities or treatment on the ground of age, disability, gender, marital or civil partner status, pregnancy or maternity, race, colour, nationality, ethnic or national origin, religion or belief, or sex, or gender reassignment, or sexual orientation.

We are opposed to all forms of unlawful and unfair discrimination.

See the full policy on www.vesuvius.com for further details.

Governance

Overall responsibility for implementing the Group's Diversity and Equality Policy rests with the Executive Directors. The Nomination Committee monitors progress with meeting its objectives. At the end of 2024, the Senior Leadership Group (comprising c.150 senior managers) consisted of 27 nationalities located in 23 countries. 15% of our overall workforce were women, which was stable versus 2023.

The Board has noted the recommendation from the Parker Review, that each FTSE 350 company should set a percentage target for senior management positions that will be occupied by ethnic minority executives, to be achieved by December 2027. The Company currently analyses management on the basis of nationality, which indicates a great deal of diversity in the senior management group, but not ethnicity. The Board has conducted a survey of ethnicity for senior management positions, but has determined that no ethnicity target should be set at this time. The first survey took place in April 2024.

Copies of the Board Diversity Policy and Group Policy on Diversity and Equality are available to view on the Vesuvius website: www.vesuvius.com. Further information on the Group's approach to promoting diversity can be found on page 108.

Diversity and equality

Measuring performance and building improvement plans

Diversity and equality effectiveness questions are included in our annual employee engagement survey and action planning. Specific objectives are included in the personal objectives of the Executive Directors and other Group Executive Committee's members and have an impact on their Short- and Long-Term Incentive outturn.

There is a clear focus on building a diverse culture at all the levels of the organisation and each Business Unit drives their own strategic initiatives to make Vesuvius an attractive place to work for a diverse workforce. Examples below illustrate how we make a difference locally in a decentralised organisation. We focus on our key markets such as India, China, Brazil, USA, Poland,

Germany and Belgium. Our local training and recruitment programmes in these markets aim to build diverse teams that strengthen our technical capabilities and support business growth. It is worth noting that these are our 'talent pool' countries which we strategically use for building capability in Vesuvius.

It is the intent of Vesuvius Leadership to achieve a multicultural and integrated community of excellent professionals of all backgrounds at Vesuvius, representing our customers and the communities where we work. While we expect Vesuvius' leadership population to increase in diversity in many areas (gender, geographic origin, social and ethnic backgrounds, and cognitive and personal strengths), we focus on two measures: gender diversity and the international character of our management.

Diversity – 31 December 2024

	Female	Male	Gender not available ¹	Total	Female (%)	Male (%)
Board	4	5		9	44%	56%
Group Executive						
Committee members	2	6		8	25%	75%
Leadership roles reporting to members of the GEC	12	41		53	23%	77%
Directors of subsidiaries included in consolidation ²	14	71		85	16%	84%
Senior Managers³	28	118		146	19%	81%
All other employees	1,645	9,339	3	10,987	15%	85%
Vesuvius employees	1,673	9,457	3	11,133	15%	85%
Directly supervised contractors	83	324	2,175	2,582		
Vesuvius employees and directly supervised contractors	1,756	9,781	2,178	13,715		

1. The Group had 2,582 directly supervised contractors who were contracted through third parties and for whom the Group does not hold detailed employment records.

2. Of the 85 employees who are directors of Group subsidiaries but not members of the GEC or direct reports of the GEC, 16% are women. This disclosure is made to comply with regulatory requirements. It includes directors of dormant companies. Some individuals hold multiple directorships.

3. Senior Managers as defined for the purposes of Section 414C(8)(c) include directors of the Company's subsidiaries.

	Women	Men	Women (%)	Men (%)	Unknown	Grand Total
Americas	506	2,550	16%	84%	2	3,058
Asia-Pacific	376	3,574	10%	90%		3,950
EMEA	791	3,333	20%	80%	1	4,125
Total	1,673	9,457	15%	85%	3	11,133

2024 distribution of Vesuvius employees by gender

Distribution of Vesuvius employees by gender	Full-time employees	Full-time employees (%)	Part-time employees	Part-time employees (%)	Vesuvius employees total	Vesuvius employees total	Unknown
Permanent women	1,552	14%	32	0%	1,584	15	
Permanent men	9,121	85%	27	0%	9,148	85	
Total permanent	10,673	99%	59	1%	10,732	96	2
Temporary women	89	22%	0	0%	89	22	
Temporary men	306	77%	3	1%	309	78	
Total temporary	395	99%	3	1%	398	4	1
Total women	1,641	15%	32	52%	1,673	15	
Total men	9,427	85%	30	48%	9,457	85	
Vesuvius employees	11,068	99%	62	1%	11,130	100	3

Diversity and equality

Programmes and initiatives supporting a diverse workforce

As part of a decentralised group, Vesuvius' entities are empowered to implement local initiatives to support the Group's objectives to foster diversity and inclusion. Our approach is multifaceted, addressing gender equality through strategic policies, management initiatives, workplace design, cultural transformation and long-term educational investments. Alongside local requirements such as the implementation of equal pay audits and provision of diversity training, Vesuvius' entities use opportunities such as International Women's Day to promote inclusion, alongside career development initiatives such as women's leadership circles, mentorship and sponsorship of women students, and working with specialist agencies to support the recruitment of people with disabilities. In 2024, Vesuvius employed 184 people with disabilities.

In 2024, 4,200 permanent employees – accounting for 38% of Vesuvius' workforce – received training on diversity, discrimination and harassment.

Preventing discrimination and harassment and promoting gender diversity

Our entities have identified key areas and processes to ensure diversity, equal opportunities for everyone, and anti-discrimination in the recruitment process and during work. Below are examples of initiatives we have implemented in conjunction with complying with local labour laws, the Vesuvius Code of Conduct, and the Group Diversity and Equality Policy.

Promoting gender diversity and preventing discrimination:

- A specific collective agreement on diversity, discrimination and harassment
- Equal pay audits, as well as regular remuneration review and analysis using Willis Towers Watson's Global Grading System and consultations with the external agencies
- Training on assertive communication and anti-harassment training; sexual harassment awareness sessions; unconscious bias; diversity, equality and inclusion training; targeted sessions for managers to support inclusive team management and hiring processes

- Promotion of gender diversity through International Women's Day Celebrations and Men's Health Day
- Women's affinity groups, diversity ambassadors and committees supporting minorities and vulnerable groups
- Equal Opportunities Officer function; a life coach for newly hired employees
- Helplines and assistance programmes
- Improved ergonomics of some workstations in many manufacturing sites, so that they require less physical effort and as result can be operated by any employee, regardless of gender
- Competencies and skill-based job descriptions and hiring processes to prevent discrimination during recruitment; anonymisation of the resume screening process
- Male and female representatives in the recruiters' panel
- Competence-based promotion with multiple levels of approval and a performance management toolkit to ensure equal development opportunities

- Career development initiatives such as women's leadership circles or mentorship initiatives providing advocacy for women's career development and sponsorship for women students
- Family-friendly programmes facilitating the combination of parental responsibilities and work, such as flexible work arrangements, improved maternity and paternity leave provision, childcare allowances, and occasional leaves

Including people with disabilities:

- 58% of Vesuvius sites implemented some actions to promote the inclusion of employees with disabilities
- Working with specialised agencies to support the recruitment of people with disabilities
- Adaptation of buildings to make them accessible for disabled employees
- Equal Opportunities Officer function: a life coach for newly hired employees and dedicated colleagues supporting the mentally unwell
- Training on disability and mental resilience

Sustainability in action

Supporting women and girls in STEM (Science, Technology, Engineering and Mathematics)

Driving positive change in the refractory industry

We are investing in programmes to support women and girls in STEM, helping to bridge the gender gap in technical fields. Examples include:

In India, Vesuvius continues to sponsor female engineering students through scholarships and supports the Women's Club at the College of Engineering, Pune, which provides students with access to technical courses, hackathons and leadership events. The Steel Division provided the V-ignite Graduate Training Programme, which resulted in recruitment from six National Institutes of Technology (NITs), with 50% female candidates.

Vesuvius Vietnam partnered with Ho Chi Minh University of Technology to host a Technical Day, promoting career opportunities for women in steel-making and refractory technology.

Vesuvius Mexico organises engineering internships ensuring that half of the group are women. Currently there are 24 ladies in the cohort.

In China Vesuvius supports female students by organising sessions on 'How to anchor your career' in local universities, and by running personality tests and interviews.

Through these initiatives, we drive positive change, ensuring that all employees, regardless of gender, can thrive in the refractory industry.

Recognition

Our sites in Brazil, India and USA were each recognised as a "Great Place to Work"

Vesuvius China was awarded "Best Employer" for female employees





OUR COMMUNITIES

We seek to establish strong relationships with key stakeholders and support the communities in which we operate.

A responsible company	111 >
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A responsible company

Vesuvius is committed to making a positive contribution to society. As part of this, we focus on operating an ethical business with appropriate policies in place to ensure compliance with the regulations and laws in all our markets.

Working with third parties

The Board is responsible for setting the culture and values of the organisation including ethics-related matters. The Group Executive Committee is responsible for their implementation.

Business ethics

Vesuvius maintains high ethical standards globally through compliance with applicable laws, the Vesuvius Code of Conduct and Vesuvius' Policies and Procedures. Vesuvius' compliance 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 Vesuvius employees and our external stakeholders 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.

Vesuvius' Code of Conduct affirms our commitment to competing vigorously, but honestly, and not seeking competitive advantage through unlawful means. We conduct ourselves ethically in all public affairs activities, in alignment with local laws and regulations. We do not engage in unfair competition, exchange commercially sensitive information with competitors or acquire information regarding a competitor by inappropriate means. When received for business purposes, we safeguard third-party confidential information and use it only for the purpose for which it was provided.

Anti-bribery and corruption

We engage with selected third-party representatives and intermediaries in our business. We recognise that they can present an increased 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. Only by acting together with our customers, suppliers and other third parties can we ensure that our goods are not supplied to restricted parties.

Risks and applicable rules are outlined in our Anti-Bribery and Corruption Policy which is available to view at: www.vesuvius.com. The Group Executive Committee, together with the management of each Business Unit or Global Function, is responsible for the Policy, its implementation and day-to-day execution. Bribery and corruption in any form (monetary or otherwise) is unacceptable and firmly prohibited.

As part of our 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. We are committed to compliance with sanctions and trade restrictions.



A responsible company

Vesuvius also recognises other risks related to money laundering, conflicts of interest and relationships with politically exposed persons. The Company does not engage in any form of activity to help criminals legalise the proceeds of crime.

Our external stakeholders including customers and suppliers can raise ethical concerns or potential misconduct without fear of retaliation through the Speak Up whistleblowing helpline available 24/7 (more about Speak Up on pages 89–90).

Due diligence

During 2024, the Group continued the due diligence review of our third-party representatives and intermediaries. We repeated the enhanced due diligence reviews of sales agents, custom clearance agents, distributors and logistics providers, undertaken in prior years.

During the year we completed due diligence on more than 2,000 counterparties worldwide. As a result of this process, we terminated relationships with 29 counterparties who did not meet our standards.

Anti-Bribery and Corruption Policy

This Policy sets out the responsibilities for all Vesuvius Directors, officers and employees, and those working for us, in observing and upholding our zero-tolerance position on bribery and corruption; and provides information and guidance to those working for us on how we recognise and deal with bribery and corruption issues.

The Policy covers the following areas of potential risk:

- Third parties
- Gifts, hospitality and entertainment
- Donations and sponsorship
- Facilitation payments
- Dealing with public officials
- Promotional activities
- Bidding and tendering
- Market access
- Outside interests

See the full policy on www.vesuvius.com for further details.

100%

of targeted employees received Anti-Bribery and Corruption training in 2024

Human rights and labour

Vesuvius extends its commitment to human rights and ethical business practices beyond our own operations, applying the same standards to our global supply chain. Our Code of Conduct is grounded in international human rights frameworks, including the UN Universal Declaration of Human Rights, International Labour Organization's Fundamental Conventions, and UN Global Compact Principles.

Key Principles of Supplier Collaboration:

- Zero tolerance for forced or child labour
- Respect for freedom of association
- Commitment to fair labour practices, equality and safe workplace
- Prohibition of discriminatory employment practices

These principles have been integrated into the work of our procurement teams as we assess our suppliers and their business practices. The Policy was reviewed and updated in 2022.



Responsible sourcing

Vesuvius recognises the crucial role that its suppliers play in creating value in the products and services that Vesuvius ultimately provides to its customers. In addition to the consistent and timely supply of materials, products and services which are of the highest quality, we expect our suppliers to operate in a manner that is appropriate, in terms of their ethical, legal, environmental and social responsibilities.

Vesuvius purchases raw materials, comprising unprocessed and processed mined materials, and chemicals. We source materials globally, with important sources in China, North America, Europe and India. Our supply chain also includes capital equipment and specialist services.

Principles and governance

Overall, our objective is to encourage suppliers to implement a meaningful sustainability programme, embrace the UN Global Compact principles, evaluate and reduce our upstream CO₂ emissions and identify potential risks (and if necessary, address them) in our supply chain. The satisfaction of our customers' requirements, 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 raw material suppliers. The principles of sustainable procurement are prescribed within the Vesuvius Sustainable Procurement Policy and supported by supplementary processes.

The Group Executive Committee has overall responsibility for supply chain management. Selected categories of raw materials requiring global coordination are managed by the Group procurement organisation, which reports into the Chief Executive, whilst others are managed locally in the Business Units and Regions.

Supplier development programmes are coordinated between these functions and the Compliance Sustainability teams. These programmes include supplier training, assessments and auditing on various topics covered by the Sustainable Procurement Policy.

Sustainable Procurement Policy

We operate a Sustainable Procurement Policy which outlines key criteria for suppliers. The Policy uses the Group Procurement's 'Request for Quotation' (RFQ) process to engage a significant number of Vesuvius suppliers and is provided in conjunction with the Vesuvius Terms and Conditions of Purchase.

For suppliers to participate in the RFQ, they are obliged to accept and agree to the terms of the Sustainable Procurement Policy, as it forms an addendum to Vesuvius' standard contract clauses. Once accepted, it is the responsibility of the supplier to verify and monitor compliance against the Policy – both for their operations and those of any sub-contractors. The full policy is available on the Vesuvius website.

Since its inception in 2021, 305 active vendors, representing 66% of the raw material spend, have formally pledged to comply with the Policy (92% of the targeted group participating in the RFQ process, 31% of the total number of active raw material suppliers).

In 2024 we spent £300.5m with suppliers who have formally agreed to comply with our Sustainable Procurement Policy.

The Sustainable Procurement Policy applies to all suppliers of goods and/or services either used in our manufacturing processes and/or sold directly by us to customers, including tolling and resale suppliers. It applies to suppliers, their agents and their sub-contractors.

The major elements of the Sustainability Procurement Policy are:

- Employees and human rights
- Conflict minerals
- Ethical and compliant business practices
- Environment
- Quality
- Business continuity

See the full policy on www.vesuvius.com for further details.

Responsible sourcing

Analysing slavery and human trafficking risks in the supply chain

Vesuvius is committed to working only with suppliers that respect the UN Global Compact's ten principles, and in particular do not employ child labour and forced labour. 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.

During 2024, we published our ninth transparency statement outlining the Group's approach to the prevention of slavery and human trafficking in our business and supply chain. A copy of our latest statement is available to view on our website: www.vesuvius.com.

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

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

As our spend with mining and extractive industry suppliers is far greater than the other three industries, and the number and diversity of suppliers is also the greatest, we have been focusing our efforts on these industries. We have deepened our investigation of higher-risk raw materials, based on the studies carried out by Drive Sustainability and the Responsible Minerals Initiative on the responsible sourcing of materials in the automotive and electronics industries, with which our portfolio of raw materials shares many commonalities.

In 2024, 51% of our raw material spend was covered by this risk assessment. Four categories of raw materials were identified as presenting potentially higher risk: mica, graphite, bauxite and derived materials (aluminium, alumina), and platinum.

In 2024, we provided webinar training on modern slavery to our key purchasing staff and continued to use an online e-learning module to upgrade the training given to all supplier-facing staff. It 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 100% of the targeted staff.

See the Group's Statement on the Prevention of Slavery and Human Trafficking: www.vesuvius.com/en/sustainability/our-policies/statement-on-modern-slavery.html

Supplier risk profile and due diligence process

Vesuvius conducts due diligence across our upstream and downstream value chain, with a strategic focus on managing potential risks associated with our business relationships.

The Procurement team organisations in each Business Unit oversee the continuous assessment of risks and opportunities related to our suppliers. Inputs include:

- Interaction with our suppliers, via our procurement organisation or on-site audits
- Assessment of potential negative impacts, identification and mitigation of risks
- Ongoing evaluation of business relationships and operational environments

Criteria for supplier due diligence:

- Screening and desktop analysis for new suppliers
- Country of origin risk assessment
- Ownership structure evaluation

The process enables us to proactively prevent, mitigate and account for potential negative impacts on the environment and people throughout our value chain.

Responsible sourcing

Engaging with suppliers in higher-risk markets

We have engaged in a process of verifying our supplier base of mica and graphite as these industries have been widely recognised as a risk in this respect.

In 2021, we contacted all of our mica suppliers and requested formal proof that they did not use child labour. Following a study of their responses, we requested that suppliers undertake sustainability evaluations, with a heavy emphasis on human rights. By the end of 2023, 100% of our mica suppliers had certified that they did not use child labour and had completed, or were in the process of completing, a sustainability assessment. We have since ended our agreements with those suppliers who refused to participate in a sustainability assessment.

We began a similar approach with our graphite suppliers in 2022. By the end of 2023, we had established that suppliers representing 74% of our graphite spend did not use child labour and had finished, or were in the process of completing, a sustainability assessment.

In 2025, we will update the expired assessments and launch the assessment of any new mica and graphite suppliers. We also plan to start engaging with our suppliers of bauxite, aluminium, alumina and platinum on this topic.

Training on child labour, slavery and/or human trafficking

In line with our modern slavery risk assessment, we provide webinar training to our key purchasing staff and we 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 100% of the targeted staff.

See the Group's Statement on the Prevention of Slavery and Human Trafficking: www.vesuvius.com/en/sustainability/our-policies/statement-on-modern-slavery.html

Conflict minerals

European Union and United States legislation and OECD due diligence guidance, generally define conflict minerals as minerals mined in countries either suffering from armed conflict, such as civil war or in a fragile post-conflict state or experiencing weak or non-existing governance and systematic violations of international law, including human rights abuses, and which directly or indirectly finance or benefit armed groups in the Democratic Republic of Congo (DRC) or any adjoining country. The minerals currently included in the list of conflict minerals are cassiterite (tin), coltan (tantalum), wolframite (tungsten) and gold (collectively known as 3TG), as well as derivatives of these minerals.

As the consumable products manufactured by Vesuvius do not contain any 3TG in their recipes, Vesuvius' exposure to such risk is assessed as very low. In addition, it is Vesuvius' policy to prohibit the use of conflict minerals in its products. This policy, over which the Group Executive Committee has oversight, covers 100% of Vesuvius' operations. It is available to view at: www.vesuvius.com.



Responsible sourcing

We routinely review our purchasing portfolio to check for conflict minerals. In 2024, we carried out a survey of 100% of our manufacturing sites to verify whether any conflict minerals had been purchased. All sites confirmed that no conflict minerals had been purchased (other than that potentially contained in electronic components). This was cross-checked with the review of our raw material spend, which similarly did not reveal any purchases of conflict minerals.

	2024	2023	2022	2021
Total revenue (£) from products containing conflict minerals	0	0	0	0

Supplier Sustainability Assessments

As part of our sustainability agenda, Vesuvius has implemented a Supplier Sustainability Assessment programme, covered all suppliers of goods either used in our manufacturing processes and/or sold directly by us to customers, including Resale suppliers.

Vesuvius has partnered with an independent third-party service provider – EcoVadis – to rate our raw materials suppliers using a detailed set of criteria. These cover four themes and 21 criteria based on international standards: labour and human rights; ethics; environment; and sustainable procurement.

Supplier compliance with conflict minerals guidance is included in the scope of Supplier Sustainability Assessments carried out by a third-party independent provider.

The Supplier Sustainability Assessment methodology complies with international standards (e.g. ISO 26000, GRI, ILO, UN Global Compact). It includes the assessment of policies, measures, certifications and reporting, along with the endorsement of external CSR initiatives and principles.

Supplier assessments are carried out via a combination of questionnaires completed by suppliers, the collection of supporting documents and evidence, and the monitoring of a large number of sources (government agencies, compliance databases, sustainability networks, international organisations, NGOs, trade unions and specialised press).

In 2024, 141 employees from our procurement teams received specific training on supplier on-site sustainability and quality assessments (92% of the target group).

The Board set a target to assess at least 50% of our raw material spend by the end of 2023. As the Group was on track to reach this target, the Sustainability Council set a new objective to assess at least 60% of our raw material spend by 2025. Criteria were chosen to select participating suppliers such as supplier size and risk metrics, including:

- Category of raw material
- Availability of alternative sources
- Share of supplier revenue with Vesuvius
- Grades in previous assessments
- New suppliers
- Supply chain incidents

Since its launch, in 2021, 269 suppliers have joined the programme, representing 58% of the total raw material spend. Fewer than 8% of the suppliers assessed between 2021 and 2024 did not reach Vesuvius’ minimal EcoVadis score. We are requiring these suppliers to implement improvement actions within a three-year time frame. Progress will be monitored through routine evaluations and an annual reassessment. Across the crucial topics, the average total score of Vesuvius suppliers was 56.7, compared to an industry standard of 47.3.



Responsible sourcing

Supplier 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. The process entails an extremely comprehensive review, including research and development to ascertain the compatibility of suppliers' products.

Our leadership participated in regional conferences and sharing and learning sessions in India, China and Germany. These help us understand the best practices being implemented, and key challenges faced by the industry and solutions to overcome them.

Supplier Sustainability Assessment criteria

Environment

Energy consumption and GHGs
 Water
 Biodiversity
 Local and accidental pollution
 Materials, chemicals and waste
 Product use
 Product end of life
 Customer health and safety
 Environmental services and advocacy

Labour and human rights

Employee health and safety
 Working conditions
 Social dialogue
 Career management and training
 Child labour, forced labour and human trafficking
 Diversity, discrimination and harassment
 External stakeholder human rights

Ethics

Corruption
 Anti-competitive practices
 Responsible information management

Sustainable procurement

Supplier environmental practices
 Supplier social practices

21 criteria based on international standards.



Responsible sourcing

Supplier CSR and quality audits

Vesuvius conducts an annual Supplier Audit programme focusing on Corporate Social Responsibility (CSR) practices, product quality and security of supply. The programme is led by the Group's Purchasing and Quality teams. The goal of the audits is to verify that our suppliers abide by fundamental principles regarding the environment and social practices, and reduce the number of quality issues that may affect our raw materials.

As part of this, we carry out on-site inspections, 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 customers, problem resolution and application of lessons learned.

Sustainability criteria:

The main areas of attention are environmental and social practices. Particular emphasis is placed on child and forced labour, ground pollution, handling of hazardous waste, working conditions and personal protective equipment. We also include a number of 'red flag' items in our on-site verification questionnaire, especially addressing human rights issues, such as child or forced labour, for which immediate escalation and investigation is required in case any breach is detected. The scope of the audit also covers working conditions.

Our supplier audits complement the assessments carried out by our third-party partner.

In 2024, 123 audits were conducted (100% on-site) (2023: 157, 2022: 142). No cases of human rights breaches were detected as part of the supplier audit checks. Whenever suppliers fail to meet the required standards, either action is taken to support them to improve or our relationship with them is terminated. In May 2024, the audit questionnaire was extended to include more specific questions regarding CSR, sustainability and process control. In 2024, 14.6% of audited suppliers received grades below the threshold of a C- score (2023: 5.7%). Whenever suppliers fail to meet the required standards, either action is taken to support them to improve or our relationship with them is terminated.

In 2025, we will start building supplier performance scorecards, which will include CSR and quality audit results.

123

CSR and quality audits carried out at supplier facilities



Responsible sourcing

Supplier Corrective Action Requests

To ensure the integrity of our products, we have a rigorous approach to issues relating to the quality of raw materials and other inputs to our processes. When a supplier does not meet expectations, we issue a formal Supplier Corrective Action Request. Our proven 8D methodology is then used to investigate the root cause of the issues and define corrective actions. A web-based portal is available for suppliers to document the containment actions implemented and outcome of the investigation, to enable review by us.

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

Supplier CO₂ emissions

We are progressively building a more precise knowledge of suppliers' CO₂ emissions, including data per raw material and supplier, to properly establish and drive improvement plans. We are using our RFQ process to gain a better understanding of these upstream CO₂ emissions and collect supporting data. This requires participating raw material suppliers to provide information on their energy sources, CO₂ emissions and improvement plans.

In 2023, Vesuvius stopped using the GHG Protocol managed Quantis Scope 3 evaluator tool as it was withdrawn, and the opportunity was taken to implement the more accurate Sustrax platform, which offers the possibility to evaluate Scope 3 emissions at a greater level of detail. We evaluated the CO₂ emissions associated with our raw materials by splitting them into more than 70 categories, each with average CO₂e emissions factors derived from supplier data, databases or publicly available information.

More than half of the emissions come from the three categories of materials that undergo high-temperature processes after mining (dead burned magnesia, fused magnesia, silicon carbide).

In 2022, we started engaging directly with the largest suppliers of some of our most CO₂ intensive and high-volume raw materials to provide training and further improve the quality of data collected. Between 2021–2023, 209 supplier sites (representing a total spend of £136m in 2023) responded to the request for information on their energy sources and CO₂ emissions. 92 (representing a total spend of £73m in 2023) reported that they had set emissions reductions targets and established action plans.

In 2024 we piloted a more robust approach to improve the accuracy of our data, requesting Product Carbon Footprint data from suppliers. Preparing this information has proven to be a challenging task for many suppliers. We received responses representing c.0.5% of our raw material spend and an estimated 8% of the suppliers included in the project phase. In 2025 we plan to expand our programme to all quoted materials and improve response rates.

In 2024, it was estimated that the CO₂e emissions from purchased goods and services amounted to 1,451 thousand metric tonnes of CO₂e, representing 82% of Vesuvius' Scope 3 emissions and 72% of Vesuvius' total CO₂e emissions.

72%

of Vesuvius' total CO₂ emissions are from purchased goods and services

Working with trade associations, lobbying and political expenses

Vesuvius does not allow contributions to political candidates or political parties and does not incur political expenditure. Vesuvius seeks to comply with all applicable laws that require reporting on lobbying and related activities. Similarly, Vesuvius does not have any direct political involvement and prohibits any direct lobbying expenditure or spend of any corporate funds on political advocacy.

Advocacy on non-political topics relevant to the business is permitted. These policies apply to all Vesuvius operations (owned and joint ventures).

Vesuvius is committed to openly declaring business interests and ensuring information provided is up-to-date, complete and not misleading. Vesuvius employees are prohibited from obtaining or trying to obtain information, or making any decision dishonestly.

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.

Responsible sourcing

Vesuvius has established long-term relationships, either directly, or through some of its employees, with several national and international trade associations directly related to our activities and to those of our customers. These trade associations advocate on major public policy issues of importance to Vesuvius, and are helpful for networking, building industry skills, civic participation and monitoring of industry policies and trends. They also provide information and perspectives on legislative matters of significance to the Group and our lines of business. Vesuvius' participation as a member of these associations comes with the understanding that we may not always agree with all the positions of an association or its other members.

Vesuvius is a member of many industry associations, including the World Refractories Association, CerameUnie (Belgium), the European Refractory Producers Association (EU), the Association for Iron & Steel Technology (USA), the Confederation of Indian Industries, and the British Ceramics Association, the China Foundry Association, and Entreprises Pour l'Environnement (France). These industry associations have all made climate change a clear focus area, with a variety of resulting actions such as engaging with regulators and policymakers, awareness and capability building within the industry, promotion of best available practices and technologies, and management of collaborative research projects.

Vesuvius is a member of the European Refractories Producers association (PRE). It is represented by its VP Sustainability who is a member of the PRE executive committee. All public statements and position papers are reviewed by the PRE executive committee members, thereby ensuring the alignment of PRE with its constituents. The European Refractories Producers association is itself part of the European Ceramic Industry Association (CerameUnie), the body representing the ceramics industry in relationships with the EU commission. Vesuvius regularly participates in the meetings organised between CerameUnie and the EU commission. Topics on which we engage with policymakers, both directly and indirectly, include the EU taxonomy (inclusion in the delegated act and definition of technical screening criteria), ETS and carbon border adjustment (applicability to our sector and thresholds), energy taxation directive, BREF and REACH.

We are involved in various projects carried out by these associations such as:

- Product carbon footprint – Vesuvius is part of the working group set up by the World Refractory Association to harmonise methodology and assumptions across all companies within our industry
- Work on the Technical Screening Criteria definition for our sector to determine what products would be eligible and aligned under the EU taxonomy directive – a project led by the European Refractory Producers Association

Other topics we engage in include safety, the development of recycling, environmental regulations, training and upskilling of the workforce, and non-financial reporting and disclosures.



£'000	2024	2023	2022	2021	2020
Political expenses	0	0	0	0	0

£'000	2024	2023	2022	2021	2020
Industry associations expenses (membership fees)	139	120	109	99	105

Community engagement

Vesuvius wants to make a positive contribution to the communities in which we operate by supporting a wide variety of fundraising and community-based programmes around the world.

We prefer participation in events, donations in kind to registered not-for-profit organisations and participation in community programmes, rather than cash donations.

Our entities have identified local needs and targeted their actions to support charities, foster education for future generations, integrate employees' family members or strengthen neighbourly relations with authorities.

Our Anti-Bribery and Corruption Policy defines rules for the proper handling of donations and sponsorship.

Below are some examples of the many community programmes and activities our colleagues were involved in throughout 2024.

Charity and community initiatives

Vesuvius sites continued to make meaningful contributions to their communities in 2024, expanding the scope and impact of our initiatives:

Supporting local communities

Vesuvius demonstrated impressive commitment to helping flood victims in the Rio Grande do Sul state of Brazil during April and May 2024. Employees organised a nationwide charity campaign to collect essential items for affected families. Vesuvius matched every employee donation, resulting in a total contribution of 14,000 units of baby nappies and 4,000 litres of bottled water.

In India, employees organised a blood donation drive, collecting 63 units of blood to support local healthcare.

To celebrate India's Independence Day, we engage 50 of our employees' children to create artwork and develop their creativity.

In Brazil, 'November Blue' campaigns promoted prostate cancer awareness and men's health through educational and health-focused initiatives.

Our employees in India participated in the 'Swachhata Hi Seva' (Cleanliness is Service) campaign, cleaning a local temple area and promoting sustainable waste management, especially plastic waste reduction.

Environmental stewardship

Over 100 trees, were planted by employees and contractors as part of the World Environment Day 2024 in India and China.

Additional activities included a 'Waste to Wealth' craft-making competition and 3R (Reduce, Reuse, Recycle) idea-sharing sessions on waste and energy efficiency.

Employee and family engagement

Our family programmes continued to thrive, including family days, end-of-year celebrations and activities for employees' children at sites in China, India, Poland and Mexico.

In China, employees participated in 'City Walk – Health Hiking' and 'Running in the Spring' events promoting fitness and camaraderie and attracting employees from across the country.

Supporting education and local collaboration

In India, we supported education initiatives through the development of school infrastructure, scholarships and cultural heritage projects focused on sustainable mobility and safety.

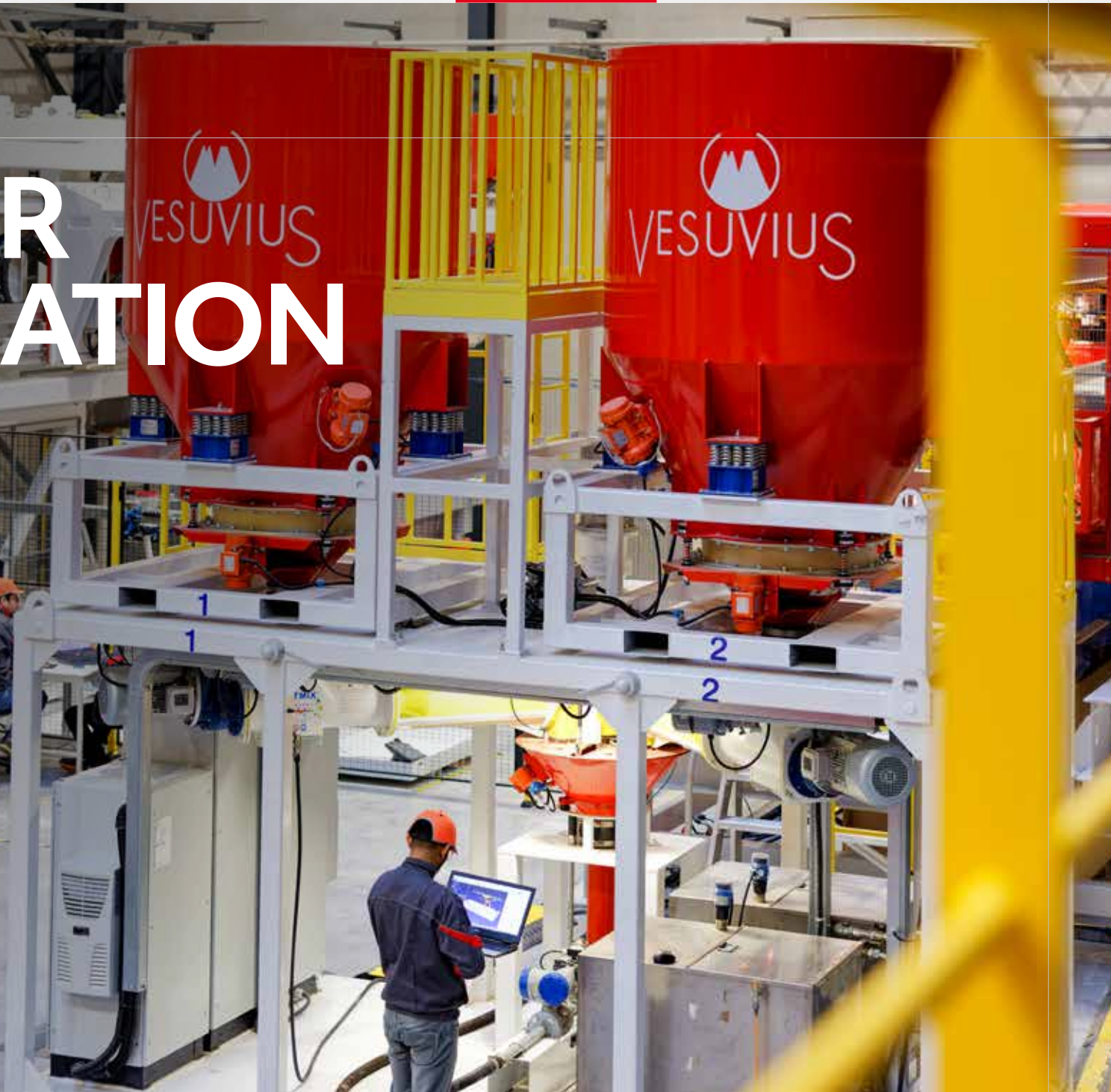
Pune, India, organised educational awareness activities in partnership with local authorities, aligned with our sustainability strategy of benefitting 'Our Planet, Customers, People and Communities'.

£'000	2024	2023	2022	2021	2020
Cash donations to registered not-for-profit organisations	129	91	760 ¹	189	248

1. Exceptional donation to Medecins sans Frontiers.



FURTHER INFORMATION



United Nations Global Compact

United Nations Global Compact

In October 2020, Vesuvius became a signatory to the United Nations Global Compact (UNGC). We have committed to base our business approach on its ten Principles, including its precepts 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 reports annually on its sustainability activities, commitments and progress in the Annual Report and also in a separate Sustainability Report published each year. This covers the Environmental, Social and Governance issues defined in the four dimensions of the Group's Sustainability Charter: our planet, our customers, our people, and our communities. In particular, we include updates on KPIs and progress against targets. Vesuvius also reports progress in the UNGC online platform.

Human rights

Principle 1

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

Principle 2

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

Labour standards

Principle 3

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

Principle 4

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

Principle 5

Businesses should uphold the abolition of child labour

Principle 6

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

Environment

Principle 7

Businesses should support a precautionary approach to environmental challenges

Principle 8

Businesses should undertake initiatives to promote greater environmental responsibility

Principle 9

Businesses should encourage the development and diffusion of environmentally friendly technologies

Anti-corruption

Principle 10

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

Sustainable Development Goals

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

Priority SDGs and targets



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

- 8.2 Achieve higher levels of economic productivity through diversification, technological upgrading and innovation, including through a focus on high-value added and labour-intensive sectors
- 8.3 Promote development-oriented policies that support productive activities, decent job creation, entrepreneurship, creativity and innovation, and encourage the formalisation and growth of micro-, small- and medium-sized enterprises, including through access to financial services
- 8.4 Improve progressively, through 2030, global resource efficiency in consumption and production and endeavour to decouple economic growth from environmental degradation, in accordance with the ten-year framework of programmes on sustainable consumption and production, with developed countries taking the lead
- 8.5 By 2030, achieve full and productive employment and decent work for all women and men, including for young people and persons with disabilities, and equal pay for work of equal value
- 8.8 Protect labour rights and promote safe and secure working environments for all workers, including migrant workers, in particular women migrants, and those in precarious employment



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

- 9.2 Promote inclusive and sustainable industrialisation and, by 2030, significantly raise industry's share of employment and gross domestic product, in line with national circumstances, and double its share in least developed countries
- 9.4 By 2030, upgrade infrastructure and retrofit industries to make them sustainable, with increased resource-use efficiency and greater adoption of clean and environmentally sound technologies and industrial processes, with all countries taking action in accordance with their respective capabilities
- 9.5 Enhance scientific research, upgrade the technological capabilities of industrial sectors in all countries, in particular developing countries, including, by 2030, encouraging innovation and substantially increasing the number of research and development workers per 1 million people and public and private research and development spending



Ensure sustainable consumption and production patterns

- 12.4 By 2020, achieve the environmentally sound management of chemicals and all wastes throughout their life cycle, in accordance with agreed international frameworks, and significantly reduce their release to air, water and soil in order to minimise their adverse impacts on human health and the environment
- 12.5 By 2030, substantially reduce waste generation through prevention, reduction, recycling and reuse
- 12.6 Encourage companies, especially large and transnational companies, to adopt sustainable practices and to integrate sustainability information into their reporting cycle



Take urgent action to combat climate change and its impacts

- 13.1 Strengthen resilience and adaptive capacity to climate-related hazards and natural disasters in all countries
- 13.3 Improve education, awareness-raising and human and institutional capacity on climate change mitigation, adaptation, impact reduction and early warning

Supporting SDGs



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

- 3.6 By 2020, halve the number of global deaths and injuries from road traffic accidents
- 3.9 By 2030, substantially reduce the number of deaths and illnesses from hazardous chemicals and air, water and soil pollution and contamination



Achieve gender equality and empower all women and girls

- 5.1 End all forms of discrimination against all women and girls everywhere
- 5.5 Ensure women's full and effective participation and equal opportunities for leadership at all levels of decision-making in political, economic and public life
- 5.b Enhance the use of enabling technology, in particular information and communications technology, to promote the empowerment of women
- 5.c Adopt and strengthen sound policies and enforceable legislation for the promotion of gender equality and the empowerment of all women and girls at all levels



Ensure availability and sustainable management of water and sanitation for all

- 6.3 By 2030, improve water quality by reducing pollution, eliminating dumping and minimising release of hazardous chemicals and materials, halving the proportion of untreated wastewater and substantially increasing recycling and safe reuse globally
- 6.4 By 2030, substantially increase water-use efficiency across all sectors and ensure sustainable withdrawals and supply of freshwater to address water scarcity and substantially reduce the number of people suffering from water scarcity



Promote peaceful and inclusive societies for sustainable development, provide access to justice for all and build effective, accountable and inclusive institutions at all levels

- 16.5 Substantially reduce corruption and bribery in all their forms

Sustainability governance structure

Board oversight

The Board holds overall accountability and oversight for all matters related to sustainability and the management of all risks and opportunities, including the impact of climate change on the Group. In setting the Group's strategy it ensures that sustainability is embedded at the heart of the Group and is reflected in the operational plans of each Business Unit. The Board formally reviews all significant sustainability programmes.

The Board's oversight of the Group's response to climate change is integrated into both its monitoring of the Group's broader sustainability strategy and initiatives, and its approach to significant capital and other investments. The Board formally discusses the Group's sustainability initiative at least twice per year.

It sets the Group's priorities and targets, and reviews the Group's performance and progress against them. It also monitors the Group's external ESG ratings.

The Board has undertaken a detailed assessment of the Group's climate-related risks and opportunities, including the Group's physical and transition risks. It has also considered the formulation of the three different climate-related scenarios constructed to assess the potential financial implications of climate change and assessed the impact of climate-related risks and opportunities on the Group's strategy. It is our policy for every capital expenditure above £5m requiring Board approval to include a sustainability assessment, which incorporates climate-related parameters.

The Group's Audit Committee supports the Board in ensuring climate-related issues are integrated into the Group's risk management process, and reviewing the Group's TCFD reporting and the assessment of performance against targets. As the Executive Director with key responsibility for the delivery of the Group's strategy, our Chief Executive, Patrick André, is ultimately responsible for the sustainability initiative.

The Remuneration Committee supports the Group's sustainability initiative and climate change related objectives, through the alignment of the Group's remuneration strategy. All Business Unit Presidents and each of the regional Business Unit Vice Presidents (VPs) have a part of their annual incentive compensation tied to performance targets on CO₂e emissions reduction.

In addition, the Executive Directors and other members of the Group Executive Committee participate in the Group's Long-Term Incentive Plan, with the vesting of 20% of each award based on three ESG measures, focused on:

- Reduction of the Lost Time Injury Frequency Rate (LTIFR)
- Reduction of the Group's Scope 1 and 2 CO₂e emissions
- Improvement in the gender representation in the Senior Leadership Group

Sustainability governance structure

Management oversight

In 2020, with the launch of the Group's new sustainability initiative, a new sustainability governance structure was established, comprising a Sustainability Council, supported by the VP Sustainability reporting to the Chief Executive, and a clear set of KPIs and targets were delineated.

The Vesuvius Sustainability Council is chaired by the Chief Executive, and comprises the Group Executive Committee, VP Sustainability, regional Vice Presidents from each Business Unit, Head of Strategy, Group Head of Communication, Head of Investor Relations, VP of Marketing and Technology and Vice Presidents of the Operations.

It meets on a quarterly basis and oversees the Group's sustainability activities, especially related to climate change, monitors progress against our targets, and assists the Board with identifying and assessing the implications of long-term ESG matters, including climate-related impacts, risks and opportunities, elaborating sustainability strategy and setting priorities. The Council reports to the Board twice per year.

The VP Sustainability leads the Group's sustainability activities, coordinating the work of the Sustainability Council including the Group's assessment of the impact of ESG matters including climate change risks and opportunities and formulation of climate-related scenarios. He is also responsible for the collation of data to assess the Group's performance against its sustainability targets and KPIs, producing quarterly performance reports, managing Group-wide communications and leading external reporting and disclosures.

Responsibility for the progress of the Group against its sustainability objectives lies with the Group Executive Committee and, operationally, each Business Unit President. These Business Unit Presidents, along with the Regional Business Unit VPs, ensure the Group sustainability strategy is reflected in each Business Unit's strategy, communicating the sustainability targets inside their organisations and implementing plans – including overseeing resources and capital allocation, and selecting R&D priorities – to achieve these targets and address the climate-related risks and opportunities.

The VP Sustainability is responsible for overseeing reporting on the Group's sustainability matters and metrics. Formal channels for reporting a range of data points are embedded in the organisation. 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 these are supported by independent third-party verification.

Our Sustainability Council and VP Sustainability ensure that we have a clear set of KPIs and targets to track the Group's progress. As most KPIs and targets defined in 2020 have deadlines in 2025, in 2024, a new set of KPIs were defined, covering the Group's material topics and other topics of strategic focus (derived from the Group's Double Materiality Assessment). Our plan is to set targets associated with these KPIs with a 2030 horizon in 2025.

Employee information and representation

Employees are routinely informed of our progress through multiple channels, such as 'town hall' meetings, toolbox talks, news items on the Horizon intranet, and our internal Sustainability Newsletter. Progress on our main KPIs, case studies, specific achievements and third-party recognition are widely communicated through these.

Management and Supervisory Bodies do not include employee representatives. However, meetings with employee representatives such as the European Works Council are organised on a regular basis.

Sustainability governance structure

Group policies

We have a clearly defined governance framework to support management control and Board-level oversight of sustainability matters. This provides the policies, procedures and standards which guide how we operate our business.

The table below lists the main policies. The complete list can be found on p168.

Policies	Summary of areas covered	Key stakeholder groups
Anti-Bribery and Corruption Policy	Provides guidance on business ethics and supplements the principles set out in the Vesuvius Code of Conduct to show that all Vesuvius entities operate fairly, transparently and with integrity.	Our people Customers Business partners Suppliers
Biodiversity Policy	Covers limitations to Vesuvius activities in areas important to biodiversity.	Our people Our communities
Code of Conduct	Describes Company commitments and expectations in eight key areas (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; Conflict of Interests; Competitors).	Our people Customers Business partners Suppliers
Data Protection Policy	Establishes uniform requirements for Vesuvius' handling of personal data.	Our people Customers Business partners Suppliers
Diversity and Equality Policy	Covers Company commitments and responsibility of management with regards to equal opportunities, fair treatment and handling of any discrimination.	Our people
Environmental Policy	Describes our beliefs, organisation and responsibilities, commitments and actions.	Our people Our communities
Health and Safety Policy	Covers health and safety of our employees, contractors, visitors and other relevant stakeholders.	Our people Our communities
Human Rights and Labour Policy	Covers forced or compulsory labour and human trafficking, child labour, health and safety, freedom of association and right to collective bargaining, unlawful discrimination, harassment and abusive behaviours, remuneration, discipline policies, working hours and proportionate Security Arrangements.	Our people
Speak Up Policy	Defines minimum compliance requirements, Speak Up channels and confirms our requirement that all employees of Vesuvius have a responsibility and are expected to report any observed or suspected breaches of Ethical Standards.	Our people Customers Business partners Suppliers
Sustainable Procurement Policy	Sets out requirements from suppliers in terms of employees and human rights, conflict minerals, ethical and compliant business practices, environment, quality, and business continuity.	Suppliers

Internal controls

Quarterly sustainability performance reporting is prepared by local subject matter owners and is under the responsibility of site managers. Reports are reviewed by the sustainability leaders and presented to the Group Executive Committee. Significant unexpected variations and deviations vs plan are investigated and explained.

The Group's Internal Audit also carries out an annual verification of the main Key Performance Indicators as well as of a selection of additional metrics and statements. Weaknesses in processes are documented and lead to corrective action plans.

Vesuvius Double Materiality Assessment

General basis for preparation

Frameworks and data selection

The statements in this Sustainability Report were prepared in accordance with the European Sustainability Reporting Standard (ESRS) guidance issued by the European Financial Reporting Advisory Group (EFRAG). All data points in have been assessed as material according to our Double Materiality Assessment (DMA).

All greenhouse gas data points (GHG Scope 1-3) are reported based on the Greenhouse Gas Protocol.

Measurement basis

All the relevant policies have been applied consistently in the financial year and for comparative figures.

Reporting perimeter and consolidation

The reporting perimeter in this report includes all entities within Vesuvius' Operational Control. Thus, the consolidated quantitative ESG data comprises the parent company Vesuvius plc, subsidiaries controlled by Vesuvius plc and joint ventures.

Consolidation of all quantitative ESG data follows the principles above, unless otherwise specified.

Key accounting estimates and judgements

When actual data was not available, we used secondary data or assessments and estimates for the reporting of data points (e.g. raw material CO₂e emissions factors in Scope 3 emissions). We regularly reassess our use of estimates and judgements based on new data availability and experience. In addition, whenever detailed financial simulations would be impractical or not meaningful, we make judgements to estimate future potential financial impacts.

Threshold for restatements

Published figures from previous years have been restated where necessary to take into account updated information, including the refinement of data for the correction of errors, changes in estimates etc. Any material impact on reported figures would be clearly mentioned.

External review

All energy and greenhouse gas emissions data has been reviewed by Carbon Footprint Ltd (limited assurance). Please see the auditor's limited assurance report on page 54.

Double Materiality Assessment methodology

We adopted the double materiality methodology laid out in the ESRS using the guidance provided by EFRAG, which identifies and prioritises issues based on two dimensions: the impact or likely impact of Vesuvius on society and the environment, and the impact on Vesuvius' business, creating financial risks and opportunities for Vesuvius.

Our assessment is informed by the principles of reporting articulated within the Global Reporting Initiative (GRI) Standards 2021. The GRI content index can be found on pages 174–207 of this Report.

Scope

We considered in the scope of our assessment all entities and activities within our operational control boundaries.

When assessing actual and potential impacts in our value chain, we considered both our upstream and downstream activities. Upstream assessments were primarily focused on our tier one suppliers, relying mostly on internal knowledge.

When analysing the impacts, risks and opportunities affecting our workforce we considered employees as well as directly supervised contractors. Conversely, the impact and dependencies on our workforce have informed our analysis of material risks and opportunities.

In our impact assessment, we considered both positive and negative impacts, as well as actual and potential impacts. Financial assessments were primarily carried out for the evaluation of risks. Whenever practical and meaningful, quantitative assessments were carried out. Many topics however cannot be assessed by means other than judgement, due to lack of precise data, interactions between multiple parameters, the impossibility of modelling outcomes, lack of measurable impact etc.

Scoring

Three parameters of scale, scope and irremediable character were used, with equal weightings, in the scoring of the severity of our impacts on people and the environment.

- **Scale:** what is the magnitude of the impact after consideration of the mitigation actions already in place (1–5 rating: 1 no impact, 3 Lost Time Injuries individual, site or vicinity of site affected, 5 multiple fatalities, widespread impact on the environment)
- **Scope:** how widespread is the impact (1–4 rating: 1 local, a few people, 2 some, 3 most, 4 whole company, worldwide)
- **Irremediable character:** how long would it take to reverse the impact (1–4 rating: 1 fully reversible, 2 in a few weeks, 3 in a few years, 4 not reversible, permanent impact)

The impact on Vesuvius' business and finance/own operations was estimated in terms of the impact on trading profit (1–5 rating). The same thresholds were used as for the evaluation of principal risks.

The likelihood of each impact was also evaluated (1–4 rating: 1 impossible/nearly impossible, 2 very unlikely, 3 likely, 4 nearly certain/certain). Maximum likelihood rating was attributed to actual impacts.

For calculating risk, we consider two different perspectives: how our operations might affect the outside world (outward), and how external factors might affect our business (inward). For the outward perspective, we consider the severity of potential impacts on people and the environment, and weight these by our view of the likelihood of the impacts occurring. Similarly for the inward view, we consider the severity of potential impacts on our business' operations and finances, and weight these by our view of the likelihood of the impacts occurring.

Double Materiality Assessment methodology

Process

Step 1: Stakeholder engagement and preparation

Our materiality assessment is informed by our risk management processes, which not only consider the immediate risks to the Group, but also longer-term emerging macro trends such as the electrification of light vehicles, accelerating growth in demand for renewable energies, technological developments in iron and steel-making and policy changes impacting the cost of CO₂ emissions, all of which could profoundly affect our markets.

We routinely engage with various internal and external stakeholders, formally and informally. Details of these engagements and the parties involved are described in our s172 disclosures on pages 63–66 of our 2024 Annual Report.

Routine interactions and information updates include meetings with customers, participation in industry events, meetings with industry associations, customer questionnaires, engagement with suppliers, recent events and trends, the monitoring of ESG standards and regulations, the review of agency ratings, benchmarking with assessments by industrial peers and business impact analysis (in the case of business interruption).

In preparing the Double Materiality Assessment we also considered internal sources such as the Group Strategy, past assessments, published disclosures (Annual Reports, Sustainability Report, TCFD), and discussions with Vesuvius experts and managers. We also use internal performance reports and the outcomes of regular surveys of Vesuvius' operational teams to collect data on management approaches, systems and performance relating to environmental, safety and human resource management.

Step 2: Pre-assessment and shortlisting

As the ESRS principles on Double Materiality Assessment requirements are extensive, we chose to limit the number and groups of stakeholders involved in the pre-assessment of our sustainability-related impacts, risks and opportunities to internal subject-matter experts only.

Their knowledge of the organisation in combination with the understanding of the topics and sub-topics considered in the Double Materiality Assessment allows them to leverage the information collected in Step 1. They contribute to the update of the list of impacts, risks and opportunities (which follows the structure of the ESRS), qualitative review and documentation, rating in terms of likelihood and magnitude.

As an outcome, the 20 topics and sub-topics with the highest ratings are shortlisted.

This list was formally approved by the Sustainability Council.

Step 3: Assessment by stakeholders

The list of 20 topics with the greatest importance to our internal and external stakeholders and potential impact to the business was submitted to internal and external stakeholders via an online survey, to rate topics in terms of:

- Impact of Vesuvius on society and the environment
- Financial risks and opportunities they present for Vesuvius

41 internal stakeholders, comprising employees from all regions, Business Units and functions in the organisation, as well as 30 external stakeholders representing our customers, suppliers, investors, lenders and trade associations, participated in the survey.

Responses were analysed and a final ranking prepared.

Double Materiality Assessment methodology

Step 4: Validation and approval

The material topics have been validated and approved as material by the Group Executive Committee and the Board; they apply in our own operations and to varying degrees in those of our suppliers.

No change in the list of material topics nor in their relative prioritisation of topics was recorded in 2024.

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 into our report. Details of water stress and water consumption, biodiversity, conflict minerals and environmental compliance are all included.

Step 5: Regular updates

Following the initial approval by the Board of our Double Materiality Assessment, we have defined a process to routinely update our pre-assessment by strengthening our analyses of the impacts, risks and opportunities, and reviewing the likelihood and magnitude ratings. The resulting shortlist of top topics and sub-topics was not modified versus 2023.

In 2024 we also carried out a gap analysis between our current disclosures and the requirements of the ESRS.

We recognise that our methodology has limitations, and that the relative importance of topics may vary over time, or that major internal or external events may require the review of our materiality assessment. Consequently, we will be further developing our DMA based on the final implementation guidance published by EFRAG in 2024. Unless major internal or external events trigger a complete revision, Vesuvius will also continue to refine its Double Materiality Assessment. A three-year cycle is currently under consideration, including the review of the list of topics with subject-matter experts, the shortlisting of most important topics, and the engagement with internal and external stakeholders for the rating and selection of material topics.

Double materiality pre-assessment outcome

We are convinced that the outcome presented below is a true and fair picture of our impacts, risks and opportunities.

Main sustainability-related impacts, risks and opportunities

The following table summarises the main impacts, risks and opportunities shortlisted at the outcome of the pre-assessment. All impacts can be short, medium and long-term.

Main impacts, risks and opportunities	ESRS topic	ESRS	Potential/actual	Positive/negative	Own operations (OO)/ Value chain (VC)	Description of the impact	Location in Sustainability Report
Product quality	Customer CO ₂ emissions	E1	Actual	Negative	VC downstream	Reliability issues leading to customer production stoppage and loss of output or scrap to be remelted. These inefficiencies in customer processes result in excessive energy consumption and GHG emissions.	Our Customers
Innovation and technology	Customer CO ₂ emissions	E1	Actual	Positive	VC downstream	Supplying products with superior performance is an important part of our business model. Increased performance reduces customer downtime and quality issues. Process yield, reliability and energy efficiency are improved, translating into reduced GHG emissions.	Our Customers
Climate change	Climate change adaptation	E1	Actual	Negative	OO	Extreme weather events may affect manufacturing sites, disrupting supply to customers, and leading to increased operating costs.	Our Planet
	Scope 1 emissions	E1	Actual	Negative	OO	Scope 1 emissions originate mostly from dolomite production and high-temperature processes powered by natural gas. These are hard to abate CO ₂ e emissions.	Our Planet
	Scope 3 emissions	E1	Actual	Negative	VC upstream	Scope 3 emissions are mostly generated by raw material suppliers (materials processed at high temperatures and chemicals), and from upstream and downstream transportation. They are considerably greater than Scope 1 and Scope 2 emissions combined. Products with superior performance deliver greater CO ₂ emissions reduction for customers than the incremental emissions (especially Scope 3) required to manufacture them.	Our Planet/ Our Communities
	Energy consumption and mix	E1	Actual	Negative	OO	Processes powered by fossil fuels emit CO ₂ . We aim to improve their efficiency and convert them to carbon-free energy sources. The path and time to availability at scale and economically acceptable conditions of ovens and kilns using carbon-free energy, and the supply of energy (carbon-free electricity, hydrogen) is unclear. Carbon capture solutions for dolomite are also not expected to be available in the short to medium term.	Our Planet

Double Materiality Assessment outcome

Main impacts, risks and opportunities	ESRS topic	ESRS	Potential/actual	Positive/negative	Own operations (OO)/ Value chain (VC)	Description of the impact	Location in Sustainability Report
Sustainable supply chain	Child labour	S1 and S2	Potential	Negative	OO	The use of child labour in one of our sites, at a tier 1 supplier or upstream in the value chain would affect basic human rights and against the strong Company Values we uphold.	Our Communities
	Forced labour	S1 and S2	Potential	Negative	OO	The use of forced labour in one of our sites, at a tier 1 supplier or upstream in the value chain would affect basic human rights and against the strong Company Values we uphold.	Our Communities
Pollution	Pollution of air	E2	Potential	Negative	OO	Inadequate control or failure of ovens and kilns exhaust fumes cleaning processes could result in emissions to the air exceeding local regulatory thresholds.	Our Planet
	Pollution of water	E2	Potential	Negative	OO	Accidental spillage in a manufacturing site located near a river could result in the contamination of the land extending to the river.	Our Planet
	Pollution of soil	E2	Potential	Negative	OO	Inadequate controls or failure of industrial processes using chemicals could result in accidental pollution of soil. The ground under legacy sites or sites in operations since many decades could be contaminated with residues from past activities.	Our Planet
Water	Water consumption	E3	Actual	Negative	OO	Water consumption by manufacturing sites in high water stress areas could affect availability of water for local communities.	Our Planet
	Water discharges	E3	Potential	Negative	OO	Inadequate control or failure of process wastewater recycling or treatment unit could result in accidental releases to sewers exceeding local regulatory thresholds.	Our Planet
Biodiversity	Pollution	E4	Potential	Negative	OO	Long-term degradation of soil or accidental releases of chemicals to soil or water could affect biodiversity in the direct environment of a manufacturing site.	Our Planet
Circular economy	Resource outflows related to products and services	E5	Actual	Positive	VC	A large proportion of refractory materials are either consumed during usage by customers or recycled after usage. Increasing the share of products that can be recycled will reduce the amount of landfilling.	Our Planet
Waste	Waste	E5	Actual	Negative	OO	A large share of losses from manufacturing processes are recycled internally or by third parties. The remainder must be sent to landfilling, and a small fraction (hazardous and toxic waste) are incinerated or processed before landfilling.	Our Planet

Double Materiality Assessment outcome

Main impacts, risks and opportunities	ESRS topic	ESRS	Potential/actual	Positive/negative	Own operations (OO)/ Value chain (VC)	Description of the impact	Location in Sustainability Report
Fair compensation	Adequate wages	S1	Actual	Positive	OO	Fair compensation ensures that employees' pay is set at market competitive levels fostering employee retention, engagement and productivity.	Our People
	Collective bargaining, including rate of workers covered by collective agreements	S1	Actual	Positive	OO	Collective bargaining ensures that our employees' needs and interests, and their rights, are reflected in the way we manage their compensation, employment terms and working conditions.	Our People
Employee representation	Freedom of association, the existence of works councils and the information, consultation and participation rights of workers	S1	Actual	Positive	OO	Freedom of association is a fundamental human right. Freedom of association, employee representation, consultation and mechanisms for exchanging information are important in developing and supporting effective cooperation and interaction between employees and management, which ultimately benefit both employees and the Company.	Our People
	Social dialogue	S1	Actual	Positive	OO	Social dialogue contributes to better understanding and cooperation between employee and management, leading to better outcomes for all.	Our People
Employee health and well-being	Work-life balance	S1	Potential	Negative	OO	Poor work-life balance will affect employee engagement and may lead to health concerns for employees.	Our People
Employee safety	Health and safety	S1	Actual	Negative	OO	<p>Health and safety issues could result in lost work days, life-changing injuries, or even fatalities.</p> <p>We believe that good safety is good business. Our goal is to reach zero accidents. Efforts to improve safety on the shop floor drive overall manufacturing performance. We also strive to lead by example and support our customers' efforts to improve their safety performance.</p>	

Double Materiality Assessment outcome

Main impacts, risks and opportunities	ESRS topic	ESRS	Potential/actual	Positive/negative	Own operations (OO)/ Value chain (VC)	Description of the impact	Location in Sustainability Report
Talent attraction and development	Training and skills development	S1	Actual	Positive	OO	<p>A strong talent attraction strategy helps us to hire quality candidates, while effective talent development boosts learning, engagement and performance, driving overall business growth.</p> <p>We place a strong emphasis on managing employee performance through a well-defined three-pronged strategy (mid-year review and overall objective and personal achievement reviews). For development, we combine global learning opportunities with the specific skills development needs at the local level. Additionally, we utilise a layered communication approach that includes the Senior Leadership Group, extended team groups, 'town hall' meetings, and excellence working groups at various sites.</p>	Our People
Diversity	Diversity	S1	Actual	Positive	OO	<p>Increasing workforce diversity expands the talent pool, enhances safety and quality, improves the work atmosphere, and benefits society overall.</p>	Our People
Data security and privacy	Privacy	S1	Potential	Negative	OO	<p>Data security and privacy is a growing area of focus, due to cyber risks as well as regulations.</p>	Annual Report
Political engagement and lobbying	Political engagement and lobbying activities	G1	Actual	Positive	OO	<p>Vesuvius does not engage in any political activities. We engage in advocacy on business-related topics only, with a goal to support regulators in building legislation that imposes an optimum pace of progress in environmental matters, especially related to climate change.</p>	Our Communities
Bribery and corruption	Bribery and corruption	G1	Potential	Negative	OO, VC upstream and downstream	<p>The activity, geographic location and relationships with local authorities of many downstream business partners (customers, agents and distributors) could create risks in terms of business ethics and compliance with international regulations. Any event would present financial and reputational risks.</p> <p>We believe in fair competition and trust our people, technology service and products to drive our success. Our Values strongly oppose any form of bribery or corruption.</p>	Our Communities

Double Materiality Assessment outcome

The boundary between material topics and other strategic topics was defined considering the magnitude of the potential impacts, their irreversibility or long-term effects before mitigation actions or control measures. Material topics could result in impacts of far greater magnitude and with much longer lasting effects (either on society and the environment or on Vesuvius business performance) than the other strategic topics.

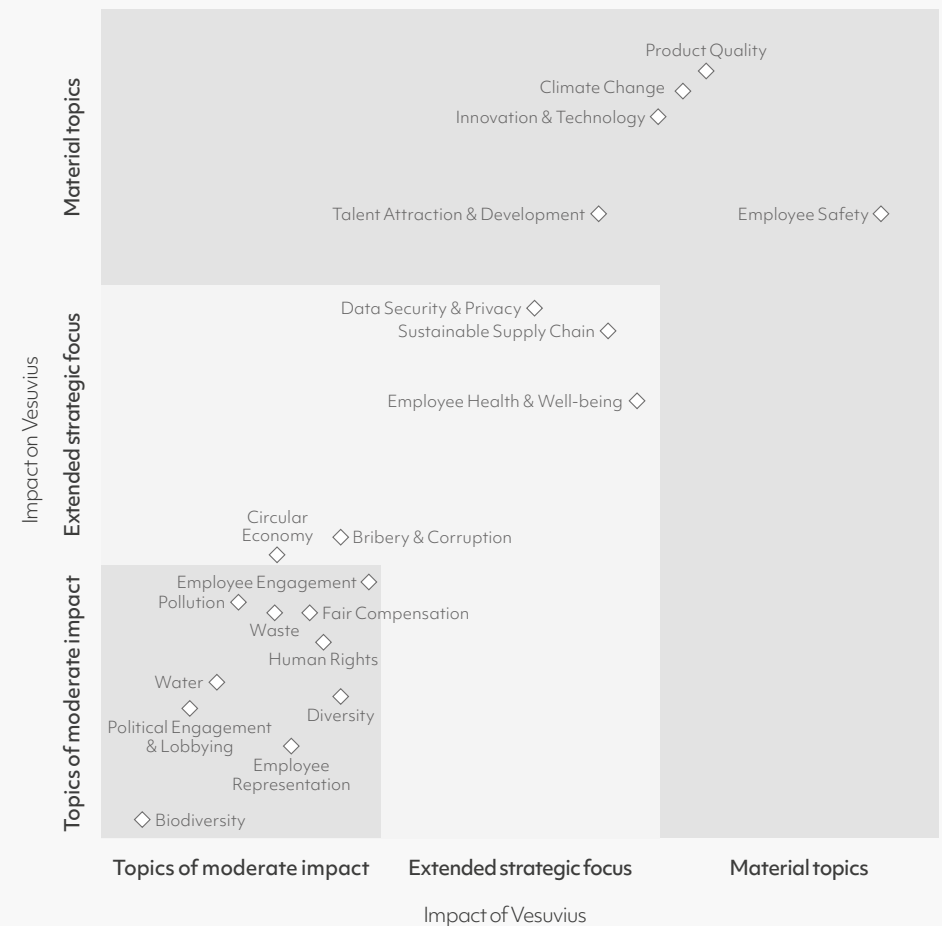
Five topics stand out according to these criteria and were therefore retained as material:

- Product quality
- Climate change (E1)
- Innovation and technology
- Employee safety (S1)
- Talent attraction and development (S1)

The potential recurring long-term impact following five topics was assessed to be significantly lower. They were therefore included in our extended strategic focus but not considered as material. As such they are not subject to formal reporting requirements under ESRS rules:

- Data security and privacy (S1)
- Sustainable supply chain (S2)
- Employee health and well-being (S1)
- Bribery and corruption (G1)
- Circular economy (E5)

Materiality matrix



Measuring the effectiveness of policies and action plans

The Board has identified nine significant non-financial KPIs for the business, aligned with the Group's main sustainability objectives (they cover 100% of our operations, owned and joint ventures). These KPIs were defined when the sustainability strategy was launched in 2020. Most targets associated with the KPIs have a deadline in 2025. Focus on these KPIs has been maintained in the following years.

We have set stretching targets for the Group's sustainability KPIs to reach within set time frames. In view of the progress made, the reduction of Scope 1 and Scope 2 CO₂e emissions target was increased in 2022 from 10% to 20% and its coverage increased from Energy CO₂e to all CO₂e emissions.

The evolution of these KPIs is monitored on a quarterly basis. Business Unit Presidents use this information to assess the effectiveness of policies and action plans, and if necessary review and adjust the allocated skills and resources.

Sustainability Key Performance Indicators for the 2020–2025 period

KPI	Measure	Target %
Safety	Lost Time Injury Frequency Rate	<1
Energy intensity	By 2025, reduce energy intensity per metric tonne of product packed for shipment (vs 2019)	-10%
CO₂e emission intensity	By 2025, reduce Scope 1 and Scope 2 CO ₂ e emission intensity per metric tonne of product packed for shipment (vs 2019)	-20%
Wastewater	By 2025, reduce wastewater per metric tonne of product packed for shipment (vs 2019)	-25%
Solid waste	By 2025, reduce solid waste (hazardous and sent to landfill) per metric tonne of product packed for shipment (vs 2019)	-25%
Recycled material	By 2025, increase the proportion of recycled materials from external sources used in production	7%
Gender diversity	By 2025, increase female representation in the Senior Leadership Group (approx. 150 top managers)	25%
Compliance training	Increase the percentage of targeted staff who complete anti-bribery and corruption training annually	90%
Supply chain	By the end of 2023, conduct sustainability assessments of our raw materials suppliers (as a percentage of Group raw material spend)	50%

Sustainability Key Performance Indicators for the 2025–2030 period

Following the preparation of the Group's Double Materiality Assessment, a new set of KPIs was defined in 2024, which will replace the current set of indicators. In 2025, we will set the targets for these new KPIs. These will allow the Group to measure the effectiveness of its policies and action plans, and its progress towards reaching its 2030 sustainability objectives.

Category	Domain	Main KPI
Material topics	Employee safety	Lost Time Injury Frequency Rate (LTIFR) Recordable Injuries Frequency Rate (RFR)
	Product quality	Customer Parts Per Million (PPM) Cost of non-quality
	Innovation and technology	Percentage of sales from new products New product sales margin
	Climate change	Scope 1 and 2 Greenhouse gas emissions – Percentage intensity reduction
	Talent attraction and development	Net promoter score Voluntary employee turnover rate of employees with less than 3 years in the Global Grading 14+ category
	Employee health and well-being	Employee engagement score
Other strategic topics	Circular economy	Solid waste – percentage intensity reduction
	Sustainable supply chain	Supplier Sustainability Assessments conducted (% of procurement spend) (EcoVadis)
	Bribery and corruption	Anti-Bribery and Corruption training (% of completion by targeted staff)
	Data security and privacy	Percentage deployment of data protection compliance protection rules
Other KPIs	Diversity	Percentage of women in the Senior Leadership Group

Task Force on Climate-related Financial Disclosures (1/3)

The disclosures included in this report and in the 2024 Annual Report are consistent with the Task Force on Climate-related Financial Disclosures (TCFD) Recommendations and Recommended Disclosures, and have been prepared taking into account the Guidance for all sectors. The disclosure is also in accordance with FCA Listing Rule requirements.

This section provides the relevant disclosures or otherwise provides cross-references, in the following table, for where the disclosures are located elsewhere in this Report and in the 2024 Annual Report.

In preparing this TCFD disclosure we considered recent developments in global affairs and macro trends, such as:

- Uncertainties regarding the projected growth of the electric vehicle market (and consequently the peak and decline of the hybrid vehicle market)
- The energy crisis and price gaps that appeared between regions, and, at the same time, the rapid reduction of the cost per installed kWh of renewable energy and associated massive investments plans
- The development and implementation of policies in all regions aimed at accelerating the transition to renewable sources of energy and the decarbonisation of industry

We concluded that the underlying assumptions and drivers of our scenario analysis, and the risks and opportunities that we have identified, do not require any significant modification this year.

We are aware of a growing acceptance that the 1.5°C global warming ambition will not be met, which supports the assumption in our scenario plans that the most optimistic scenario is a 2°C increase in global warming.

We are monitoring the introduction of ISSB standards in the UK and our future reporting will reflect changes in the regulatory landscape.

Task Force on Climate-related Financial Disclosures (2/3)

The table sets out where you can find information on how we have applied each of the recommendations of the TCFD.

Topic		Disclosure summary	Vesuvius disclosure: Annual Report		Vesuvius disclosure: Sustainability Report	
Governance	Disclose the organisation's governance around climate-related risks and opportunities.	a Describe the Board's oversight of climate-related risks and opportunities.	<i>Risk, viability and going concern</i> <i>Directors' Remuneration Report</i>	p67–71 ➔ p103–129 ➔	<i>Sustainability governance</i>	p27, p125–127 ➔
		b Describe management's role in assessing and managing climate-related risks and opportunities.	<i>Risk, viability and going concern</i>	p67–73 ➔	<i>Sustainability governance</i>	p27, p33, p34, p125–127 ➔
Strategy	Disclose the actual and potential impacts of climate-related risks and opportunities on the organisation's businesses, strategy and financial planning where such information is material.	a Describe the climate-related risks and opportunities the organisation has identified over the short, medium and long term.			<i>Our planet</i>	p27–38 ➔
		b Describe the impact of climate-related risks and opportunities on the organisation's businesses, strategy and financial planning.	<i>Our external environment</i>	p14–17 ➔	<i>Our planet</i> <i>Our customers</i>	p32–54 ➔ p68–75, p78–79 ➔
		c Describe the resilience of the organisation's strategy, taking into consideration different climate-related scenarios, including a 2°C or lower scenario.			<i>Our planet</i>	p39–43 ➔
Risk management	Disclose how the organisation identifies, assesses and manages climate-related risks.	a Describe the organisation's processes for identifying and assessing climate-related risks.	<i>Risk, viability and going concern</i>	p67–71 ➔	<i>Our planet</i>	p33–38 ➔
		b Describe the organisation's processes for managing climate-related risks.	<i>Risk, viability and going concern</i>	p69 ➔	<i>Our planet</i>	p33–38 ➔
		c Describe how processes for identifying, assessing and managing climate-related risks are integrated into the organisation's overall risk management.	<i>Risk, viability and going concern</i>	p67–71 ➔	<i>Our planet</i>	p33–38 ➔
Metrics and targets	Disclose the metrics and targets used to assess and manage relevant climate-related risks and opportunities where such information is material.	a Disclose the metrics used by the organisation to assess climate-related risks and opportunities in line with its strategy and risk management process.			<i>Progress on our sustainability targets</i>	p22, p42 ➔
		b Disclose Scope 1, Scope 2 and, if appropriate, Scope 3 GHG emissions, and the related risks.			<i>Our planet</i> <i>Further information</i>	p49–54 ➔ p142–161 ➔
		c Describe the targets used by the organisation to manage climate-related risks and opportunities and performance against targets.			<i>Progress on our Sustainability targets</i> <i>Our planet</i> <i>Further information</i>	p22 ➔ 49–54 ➔ p55–62 ➔ p142–161 ➔

Task Force on Climate-related Financial Disclosures (3/3)

Climate-related risks and opportunities – methodology

Each year the Group undertakes a robust assessment of the principal and emerging risks which could have a material impact on the Group this assessment covers all of Vesuvius' operations. As part of this process, climate-related risks are reviewed by the GEC, and subsequently by the Board, to ensure that the risk register reflects any material changes in the operating environment and business strategy, and to ensure that the management of climate-related risks is integrated into our overall principal risk management framework. The Board takes these climate-related risks and opportunities into account when quantifying the organisation's risk appetite. A number of sustainability risks are recorded in the Group's analysis of principal risk (see the Risk, viability and going concern section on pages 67–71 of our Annual Report).

The Business Units factor climate change risks and opportunities into their business planning processes, assessing the long-term impacts on profitability of both the risks and opportunities.

Greenhouse gas (GHG) reporting

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.

Statutory reporting is location-based according to the GHG Protocol.

In reporting GHG emissions, we have used the GHG Protocol Corporate Accounting and Reporting Standard (revised edition) methodology to identify our location-based GHG inventory of Scope 1 (direct) and Scope 2 (indirect) CO₂e. We report in metric tonnes of CO₂ equivalent (CO₂e). We have used emission factors from the UK Government's (Defra) and the IEA GHG Conversion Factors for Company Reporting 2023 in the calculation of our GHG emissions.

Our energy-related greenhouse gas emissions, reported as carbon dioxide equivalents (CO₂e), include direct emissions of the three main GHGs (carbon dioxide (CO₂), methane (CH₄) and nitrous oxide (N₂O)).

Process-related emissions of the following in CO₂ equivalent and in metric tonnes are not significant:

1. Direct methane CH₄ emissions
2. Direct nitrous oxide N₂O emissions

Emissions of the following in CO₂ equivalent and in metric tonnes are not significant:

1. Direct sulphur hexafluoride (SF₆) emissions
2. Direct HFC emissions
3. Direct PFC emissions

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. Performance and variation are analysed, and improvement plans built accordingly.

Our energy and Scope 1 and Scope 2 GHG data covers 100% of Vesuvius' operations including the business acquired from Universal Refractories Inc in 2021, and BMC (acquired late in 2022), but excluding, for 2019 and earlier, the management joint venture with Anshan Angang Vesuvius Refractory Company Ltd which was outside of the Operational Control Boundary.

2019 was selected as the baseline for all energy and GHG emissions data and targets, absolute and relative, as this was the last year of normal trading prior to the COVID-19 pandemic. Progress is measured against the 2019 performance.

Energy consumption and GHG emissions

Fuel consumption, emissions and normalised emissions for the main fuels consumed across the Group (location-based (Operational Control Boundary) statutory reporting)

The absolute values of the energy consumed and the location-based CO₂e emissions increased in 2024, as well as energy intensity and emission intensity per metric tonne of product packed for shipment.

In 2024, the Group's normalised energy consumption increased by 2.1%, to 1,076 kWh per metric tonne (2023: 1,054).

Location-based emissions increased by 11.4% to 0.341 metric tonnes of CO₂e per metric tonne of product packed for shipment (2023: 0.306) and market-based emissions increased by 10.2% to 0.270 metric tonnes of CO₂e per metric tonne of product packed for shipment (2023: 0.245).

The increase in energy consumption and CO₂e emissions is due to the increase of the dolime production (which had been much reduced throughout 2023 due to an incident in January 2023 which incapacitated one of our rotary kilns).

This increase was partly offset by energy intensity improvements. Natural gas use increased by 1%, electricity consumption by 1% whereas coal (a CO₂ intensive fuel and raw material used in dolime production) consumption grew by 76%, to 15,767 metric tonnes (2023: 8,974, 2022: 27,231 metric tonnes).

During 2024, the Group also consumed 364 cubic metres of diesel (+15% on 2023: 317) primarily in the operation of forklift trucks on its sites, and 28 cubic metres of fuel oil, a decrease of -83% (2023: 165). In total, 392 cubic metres of oil was used as fuel in 2024 (-19% up on 2023: 482).

In 2024, we reviewed our internal environmental reporting processes. We conducted training sessions and carried out extensive verifications of our environmental data going back to 2019. As a result we have updated some of our prior year reporting. The historic data in this report reflects these amendments, none of which were material.

Two versions of each of the tables showing historic data (2019 to 2024) affected by these changes are included in the following pages – before and after these amendments.

Location-based statutory reporting of global GHG emissions (metric tonnes CO₂e) and energy consumption ('000kWh) by type of fuel and emission

Fuel and emission category	Energy used '000 kWh 2024	Energy used '000 kWh 2023	% change	CO ₂ e '000 metric tonnes 2024	CO ₂ e '000 metric tonnes 2023	% change	CO ₂ e metric tonne per metric tonne of product 2024	CO ₂ e metric tonnes per metric tonne of product 2023	% change
Coal	117,117	66,659	76%	37.8	21.5	76%	0.042	0.025	67%
Electricity	196,397	194,295	1%	89.2	89.7	-1%	0.100	0.106	-6%
Ext. heat	2,100	2,317	-9%	0.6	0.7	-14%	0.001	0.001	-19%
LPG	71,585	68,324	5%	15.4	14.7	5%	0.017	0.017	-1%
Natural gas	562,526	556,204	1%	102.9	101.7	1%	0.115	0.120	-4%
Biomethane	6,429	–	100%	–	–	–	–	–	–
Other fuels	4,206	5,331	-21%	1.0	1.3	-24%	0.001	0.002	-28%
Total fuels	960,360	893,130	8%	246.8	229.7	7%	0.276	0.270	2%
Non-fuel process emissions				57.9	29.6	95%	0.065	0.035	86%
Fugitive emissions				0.6	1.0	-45%	0.001	0.001	-47%
Total	960,360	893,130	8%	305.4	260.3	17%	0.341	0.306	11%

Notes:

- All fuel consumption is converted to '000 kWh for reporting.
- In 2024, the Group consumed 51,139 thousand m³ of natural gas (2023: 50,564).
- Vesuvius does not use any alternative fuels (% used zero).

- Heat from biomass 0.02% (2023: 0.01%).
- Fugitive emissions are leaks of greenhouse gases, for example from refrigeration and air-conditioning units. See Further information for details.

- Location-based Statutory Reporting of Global GHG emissions (metric tonnes of CO₂e) and energy consumption ('000 kWh) (Operational Control Boundary).
- The numbers are collated from 100% of entities within the Group's Operational Control Boundary.

- The business of Universal Refractories Inc (Vesuvius Penn Corporation) which was acquired in 2021, is included in 2022 and onwards. BMC (Yingkou YingWei Magnesium Co., Ltd), which was acquired late 2022, is included in 2023 and onwards.

Energy consumption and GHG emissions

Energy consumption Scope 1 and 2 (data after amendment)

	2024		2023		2022		2021		2020		2019	
Energy consumption kWh	kWh	%	kWh	%	kWh	%	kWh	%	kWh	%	kWh	%
Scope 1: Energy consumption	764,551,587	79%	699,010,686	78%	877,975,650	81%	958,873,226	82%	838,922,462	81%	971,737,454	82%
Scope 2: Energy consumption	198,496,502	21%	196,611,670	22%	206,266,559	19%	211,153,300	18%	197,370,299	19%	209,518,592	18%
Total energy consumption	963,048,088	100%	895,622,356	100%	1,084,242,209	100%	1,170,026,525	100%	1,036,292,761	100%	1,181,256,046	100%

Notes:

- The business of Universal Refractories Inc (Vesuvius Penn Corporation) which was acquired in 2021, is included in 2022 and onwards. BMC (Yingkou YingWei Magnesium Co.,Ltd), which was acquired late 2022, is included in 2023 and onwards.
- The numbers are collated from 100% of entities within the Group's Operational Control Boundary.
- Conversion factors for GHG emissions and energy used the 2023 UK Government GHG Conversion Factors for Company Reporting. Conversion factors for GHG emissions for electricity globally used the IEA Emission Factors 2023.
- Amendments before past years' reporting errors of a few sites were corrected, including mainly the use of incorrect units of measure, non-production related energy consumption not reported, and some production processes not reported.

Energy consumption Scope 1 and 2 (data before amendment)

	2024		2023		2022		2021		2020		2019	
Energy consumption kWh	kWh	%	kWh	%	kWh	%	kWh	%	kWh	%	kWh	%
Scope 1: Energy consumption	764,551,587	79%	699,010,686	78%	877,757,259	81%	949,035,812	82%	829,616,697	81%	958,190,599	81%
Scope 2: Energy consumption	198,496,502	21%	196,611,670	22%	205,858,996	19%	210,414,774	18%	196,764,804	19%	217,718,707	19%
Total energy consumption	963,048,088	100%	895,622,356	100%	1,083,616,256	100%	1,159,450,586	100%	1,026,381,501	100%	1,175,909,306	100%

Notes:

- The business of Universal Refractories Inc (Vesuvius Penn Corporation) which was acquired in 2021, is included in 2022 and onwards. BMC (Yingkou YingWei Magnesium Co.,Ltd), which was acquired late 2022, is included in 2023 and onwards.
- The numbers are collated from 100% of entities within the Group's Operational Control Boundary.
- Conversion factors for GHG emissions and energy used the 2023 UK Government GHG Conversion Factors for Company Reporting. Conversion factors for GHG emissions for electricity globally used the IEA Emission Factors 2023.

Energy consumption and GHG emissions

Vesuvius plc long-term energy consumption and energy intensity (aggregate of Scope 1 and Scope 2) (data after amendment)

	2024 Pro forma	2024	2023 Pro forma	2023	2022	2021	2020	2019
Total energy consumption (million kWh)	1,054	963	1,057	896	1,084	1,170	1,036	1,181
Energy intensity per metric tonne of product packed for shipment (kWh/MT)	1,125	1,076	1,145	1,054	1,217	1,198	1,266	1,313
Energy intensity per million £ Revenue (kWh/M£)	579,277	529,112	547,682	464,108	544,268	700,100	731,182	724,640

Notes:

- The business of Universal Refractories Inc (Vesuvius Penn Corporation) which was acquired in 2021, is included in 2022 and onwards. BMC (Yingkou YingWei Magnesium Co.,Ltd), which was acquired late 2022, is included in 2023 and onwards.
- The numbers are collated from 100% of entities within the Group's Operational Control Boundary.
- Conversion factors for GHG emissions and energy used the 2023 UK Government GHG Conversion Factors for Company Reporting. Conversion factors for GHG emissions for electricity globally used the IEA Emission Factors 2023.
- Past years' reporting errors of a few sites were corrected, including mainly the use of incorrect units of measure, non-production related energy consumption not reported, and some production processes not reported.

Vesuvius plc long-term energy consumption and energy intensity (aggregate of Scope 1 and Scope 2) (data before amendment)

	2024 Pro forma	2024	2023 Pro forma	2023	2022	2021	2020	2019
Total energy consumption (million kWh)	1,054	963	1,057	896	1,084	1,159	1,026	1,176
Energy intensity per metric tonne of product packed for shipment (kWh/MT)	1,125	1,076	1,145	1,054	1,207	1,177	1,243	1,293
Energy intensity per million £ Revenue (kWh/M£)	579,277	529,112	547,682	464,108	543,954	693,772	724,189	721,360

Notes:

- The business of Universal Refractories Inc (Vesuvius Penn Corporation) which was acquired in 2021, is included in 2022 and onwards. BMC (Yingkou YingWei Magnesium Co.,Ltd), which was acquired late 2022, is included in 2023 and onwards.
- The numbers are collated from 100% of entities within the Group's Operational Control Boundary.
- Conversion factors for GHG emissions and energy used the 2023 UK Government GHG Conversion Factors for Company Reporting. Conversion factors for GHG emissions for electricity globally used the IEA Emission Factors 2023.

Energy consumption and GHG emissions

Evolution of energy from renewable sources usage (data after amendment)

	2024	2023	2022	2021	2020	2019
Total energy consumption ('000 kWh)	963,048	895,622	1,085,564	1,199,933	1,066,242	1,210,745
Energy from non-renewable sources ('000 kWh)	795,478	757,103	966,189	1,112,652	1,007,706	1,155,162
Energy from non-renewable sources (% of total)	83%	85%	89%	93%	95%	95%
Energy from non- CO ₂ emitting sources ('000 kWh)	172,849	145,264	131,817	107,521	79,051	79,180
Energy from non- CO ₂ emitting sources (% of total)	18%	16%	12%	9%	7%	7%
Electricity from nuclear sources ('000 kWh)	5,279	6,744	12,442	20,240	20,515	23,597
Electricity from nuclear sources (% of total)	1%	1%	1%	2%	2%	2%
Energy from renewable sources ('000 kWh)	167,570	138,520	119,375	87,281	58,536	55,583
Energy from renewable sources (% of total)	17%	15%	11%	7%	5%	5%
– Electricity from renewable sources ('000 kWh)	160,996	138,426	119,218	87,126	58,397	55,407
– Electricity from renewable sources (% of total)	17%	15%	11%	7%	5%	5%
– Biomethane ('000 kWh)	6,429	–	–	–	–	–
– Biomethane (% of total)	1%	0%	0%	0%	0%	0%
– Other renewable sources ('000 kWh)	146	94	156	155	138	176
– Other renewable sources (% of total)	0.02%	0.01%	0.01%	0.01%	0.01%	0.01%

Notes:

- The numbers are collated from 100% of entities within the Group's Operational Control Boundary.
- Re-baselined using pre-acquisition data for the business acquired from Universal Refractories, Inc. (Vesuvius Penn Corporation) and BMC (Yingkou YingWei Magnesium Co., Ltd) from 2019 onwards.
- Renewable energy includes solar panels, biomethane and biomass.
- Past years' reporting errors of a few sites were corrected, including mainly the use of incorrect units of measure, non-production related energy consumption not reported, and some production processes not reported.

Evolution of energy from renewable sources usage (data before amendment)

	2024	2023	2022	2021	2020	2019
Total energy consumption ('000 kWh)	963,048	895,622	1,084,938	1,189,357	1,056,330	1,205,398
Energy from non-renewable sources ('000 kWh)	795,478	757,103	966,075	1,102,545	998,169	1,148,388
Energy from non-renewable sources (% of total)	83%	85%	89%	93%	94%	95%
Energy from non- CO ₂ emitting sources ('000 kWh)	172,849	145,264	131,310	107,052	78,676	82,317
Energy from non- CO ₂ emitting sources (% of total)	18%	16%	12%	9%	7%	7%
Electricity from nuclear sources ('000 kWh)	5,279	6,744	12,447	20,240	20,515	25,307
Electricity from nuclear sources (% of total)	1%	1%	1%	2%	2%	2%
Energy from renewable sources ('000 kWh)	167,570	138,520	118,863	86,812	58,161	57,010
Energy from renewable sources (% of total)	17%	15%	11%	7%	6%	5%
– Electricity from renewable sources ('000 kWh)	160,996	138,426	118,707	86,657	58,023	56,834
– Electricity from renewable sources (% of total)	17%	15%	11%	7%	5%	5%
– Biomethane ('000 kWh)	6,429	–	–	–	–	–
– Biomethane (% of total)	1%	0%	0%	0%	0%	0%
– Other renewable sources ('000 kWh)	146	94	156	155	138	176
– Other renewable sources (% of total)	0.02%	0.01%	0.01%	0.01%	0.01%	0.01%

Notes:

- The numbers are collated from 100% of entities within the Group's Operational Control Boundary.
- Re-baselined using pre-acquisition data for the business acquired from Universal Refractories, Inc. (Vesuvius Penn Corporation) and BMC (Yingkou YingWei Magnesium Co., Ltd) from 2019 onwards.
- Renewable energy includes solar panels, biomethane and biomass.

Energy consumption and GHG emissions

Evolution of electricity from renewable sources usage (data after amendment)

	2024	2023	2022	2021	2020	2019
Total electricity consumption ('000 kWh)	199,398	194,295	203,658	215,447	202,569	213,206
Electricity from non-renewable sources ('000 kWh)	38,402	55,868	84,440	128,322	144,171	157,799
Electricity from non-renewable sources (% of total)	19%	29%	41%	60%	71%	74%
Electricity from non- CO ₂ emitting sources ('000 kWh)	166,274	145,171	131,660	107,366	78,912	79,003
Electricity from non- CO ₂ emitting sources (% of total)	83%	75%	65%	50%	39%	37%
Electricity from nuclear sources ('000 kWh)	5,279	6,744	12,442	20,240	20,515	23,597
Electricity from nuclear sources (% of total)	3%	3%	6%	9%	10%	11%
Electricity from renewable sources ('000 kWh)	160,996	138,426	119,218	87,126	58,397	55,407
Electricity from renewable sources (% of total)	81%	71%	59%	40%	29%	26%
– Electricity from renewable sources – Purchased ('000 kWh)	158,308	135,934	119,218	87,126	58,397	55,407
– Electricity from renewable sources – Purchased (% of total)	98%	98%	100%	100%	100%	100%
– Electricity from renewable sources – Self-generated ('000 kWh)	2,688	2,493	–	–	–	–
– Electricity from renewable sources – Self-generated (% of total)	2%	2%	0%	0%	0%	0%

Notes:

- The numbers are collated from 100% of entities within the Group's Operational Control Boundary.
- Re-baselined using pre-acquisition data for the business acquired from Universal Refractories, Inc. (Vesuvius Penn Corporation) and BMC (Yingkou YingWei Magnesium Co., Ltd) from 2019 onwards.
- Past years' reporting errors of a few sites were corrected, including mainly the use of incorrect units of measure, non-production related energy consumption not reported, and some production processes not reported.

Evolution of electricity from renewable sources usage (data before amendment)

	2024	2023	2022	2021	2020	2019
Total electricity consumption ('000 kWh)	199,398	194,295	203,251	214,709	201,963	221,406
Electricity from non-renewable sources ('000 kWh)	38,402	55,868	84,544	128,052	143,940	164,572
Electricity from non-renewable sources (% of total)	19%	29%	42%	60%	71%	74%
Electricity from non- CO ₂ emitting sources ('000 kWh)	166,274	145,171	131,154	106,897	78,538	82,141
Electricity from non- CO ₂ emitting sources (% of total)	83%	75%	65%	50%	39%	37%
Electricity from nuclear sources ('000 kWh)	5,279	6,744	12,447	20,240	20,515	25,307
Electricity from nuclear sources (% of total)	3%	3%	6%	9%	10%	11%
Electricity from renewable sources ('000 kWh)	160,996	138,426	118,707	86,657	58,023	56,834
Electricity from renewable sources (% of total)	81%	71%	58%	40%	29%	26%
– Electricity from renewable sources – Purchased ('000 kWh)	158,308	135,934	118,707	86,657	58,023	56,834
– Electricity from renewable sources – Purchased (% of total)	98%	98%	100%	100%	100%	100%
– Electricity from renewable sources – Self-generated ('000 kWh)	2,688	2,493	–	–	–	–
– Electricity from renewable sources – Self-generated (% of total)	2%	2%	0%	0%	0%	0%

Notes:

- The numbers are collated from 100% of entities within the Group's Operational Control Boundary.
- Re-baselined using pre-acquisition data for the business acquired from Universal Refractories, Inc. (Vesuvius Penn Corporation) and BMC (Yingkou YingWei Magnesium Co., Ltd) from 2019 onwards.

Energy consumption and GHG emissions

Scope 1 Direct emissions by GHG type (data after amendment)

Energy/ emission type	Scope 1 emissions in metric tonnes CO ₂ e	2024	2023	2022	2021	2020	2019	Energy/ emission type	Scope 1 emissions in metric tonnes CO ₂ e	2024	2023	2022	2021	2020	2019
Industrial coal	Total	37,832	21,506	65,666	72,764	65,586	76,354	Biomethane	Total	2	–	–	–	–	–
	of CO ₂	37,445	21,286	64,961	71,981	64,884	75,553		of CO ₂	–	–	–	–	–	–
	of CH ₄	120	69	186	206	266	213		of CH ₄	–	–	–	–	–	–
	of N ₂ O	267	152	518	576	435	588		of N ₂ O	2	–	–	–	–	–
Diesel (average biofuel blend)	Total	766	721	771	922	698	1,064	Petrol (average biofuel blend)	Total	11	13	18	13	4	7
	of CO ₂	755	712	759	909	688	1,049		of CO ₂	11	13	18	13	4	7
	of CH ₄	0.09	0.08	0.08	0.09	0.07	0.12		of CH ₄	0.04	0.05	0.06	0.04	0.01	0.02
	of N ₂ O	10	9	11	14	10	14		of N ₂ O	0.03	0.04	0.06	0.04	0.01	0.02
Fuel oil	Total	89	524	512	474	393	559	Coke oven gas	Total	–	–	–	–	–	4,745
	of CO ₂	89	522	510	472	392	557		of CO ₂	–	–	–	–	–	4,745
	of CH ₄	0	1	1	1	1	1		of CH ₄	–	–	–	–	–	–
	of N ₂ O	0	1	1	1	1	1		of N ₂ O	–	–	–	–	–	–
Light diesel oil	Total	148	76	–	–	–	–	Process CO ₂	Total	57,926	29,637	91,044	100,877	88,337	106,542
	of CO ₂	146	75	–	–	–	–		of CO ₂	57,926	29,637	91,044	100,877	88,337	106,542
	of CH ₄	0	0	–	–	–	–		of CH ₄	–	–	–	–	–	–
	of N ₂ O	2	1	–	–	–	–		of N ₂ O	–	–	–	–	–	–
LPG	Total	15,355	14,655	13,929	16,694	13,353	14,344	Fugitive emissions	Total	575	1,037	2,207	1,391	1,080	985
	of CO ₂	15,333	14,634	13,909	16,671	13,335	14,326		of CO ₂	575	1,037	2,207	1,391	1,080	985
	of CH ₄	14	13	11	13	10	9		of CH ₄	–	–	–	–	–	–
	of N ₂ O	9	8	8	10	9	9		of N ₂ O	–	–	–	–	–	–
Natural gas	Total	102,886	101,746	110,557	123,251	108,485	124,408	Total	Total	215,591	169,914	284,703	316,387	277,936	329,008
	of CO ₂	102,678	101,541	110,345	123,015	108,279	124,178		of CO ₂	214,958	169,455	283,754	315,330	276,998	327,942
	of CH ₄	158	156	151	168	148	162		of CH ₄	292	238	349	389	424	386
	of N ₂ O	51	49	61	67	59	68		of N ₂ O	341	221	600	669	514	681

Notes:

- The numbers are collated from 100% of entities within the Group's Operational Control Boundary.
- Re-baselined using pre-acquisition data for the business acquired from Universal Refractories, Inc. (Vesuvius Penn Corporation) and BMC (Yingkou YingWei Magnesium Co., Ltd) from 2019 onwards.
- Past years' reporting errors of a few sites were corrected, including mainly the use of incorrect units of measure, non-production related energy consumption not reported, and some production processes not reported.

Energy consumption and GHG emissions

Scope 1 Direct emissions by GHG type (data before amendment)

Energy/ emission type	Scope 1 emissions in metric tonnes CO ₂ e	2024	2023	2022	2021	2020	2019	Energy/ emission type	Scope 1 emissions in metric tonnes CO ₂ e	2024	2023	2022	2021	2020	2019
Industrial coal	Total	37,832	21,506	65,666	72,764	65,586	76,354	Biomethane	Total	2	–	–	–	–	–
	of CO ₂	37,445	21,286	64,961	71,981	64,884	75,553		of CO ₂	–	–	–	–	–	–
	of CH ₄	120	69	186	206	266	213		of CH ₄	–	–	–	–	–	–
	of N ₂ O	267	152	518	576	435	588		of N ₂ O	2	–	–	–	–	–
Diesel (average biofuel blend)	Total	766	721	762	902	696	1,061	Petrol (average biofuel blend)	Total	11	13	18	13	4	7
	of CO ₂	755	712	751	888	686	1,047		of CO ₂	11	13	18	13	4	7
	of CH ₄	0.09	0.08	0.08	0.09	0.07	0.12		of CH ₄	0.04	0.05	0.06	0.04	0.01	0.02
	of N ₂ O	10	9	11	13	10	14		of N ₂ O	0.03	0.04	0.06	0.04	0.01	0.02
Fuel oil	Total	89	524	523	498	393	559	Coke oven gas	Total	–	–	–	–	–	4,745
	of CO ₂	89	522	521	496	392	557		of CO ₂	–	–	–	–	–	4,745
	of CH ₄	0	1	1	1	1	1		of CH ₄	–	–	–	–	–	–
	of N ₂ O	0	1	1	1	1	1		of N ₂ O	–	–	–	–	–	–
Light diesel oil	Total	148	76	–	–	–	–	Process CO ₂	Total	57,926	29,637	91,044	100,877	88,337	106,542
	of CO ₂	146	75	–	–	–	–		of CO ₂	57,926	29,637	91,044	100,877	88,337	106,542
	of CH ₄	0	0	–	–	–	–		of CH ₄	–	–	–	–	–	–
	of N ₂ O	2	1	–	–	–	–		of N ₂ O	–	–	–	–	–	–
LPG	Total	15,355	14,655	13,932	16,728	13,344	14,336	Fugitive emissions	Total	575	1,037	2,207	1,391	1,080	985
	of CO ₂	15,333	14,634	13,912	16,705	13,325	14,317		of CO ₂	575	1,037	2,207	1,391	1,080	985
	of CH ₄	14	13	11	13	10	9		of CH ₄	–	–	–	–	–	–
	of N ₂ O	9	8	8	10	9	9		of N ₂ O	–	–	–	–	–	–
Natural gas	Total	102,886	101,746	110,514	121,419	106,784	121,927	Total	Total	215,591	169,914	284,898	314,843	276,403	326,718
	of CO ₂	102,678	101,541	110,302	121,187	106,580	121,701		of CO ₂	214,958	169,455	283,949	313,789	275,468	325,656
	of CH ₄	158	156	151	166	145	159		of CH ₄	292	238	349	386	422	383
	of N ₂ O	51	49	61	66	58	66		of N ₂ O	341	221	600	667	513	679

Notes:

- The numbers are collated from 100% of entities within the Group's Operational Control Boundary.
- Re-baselined using pre-acquisition data for the business acquired from Universal Refractories, Inc. (Vesuvius Penn Corporation) and BMC (Yingkou YingWei Magnesium Co., Ltd) from 2019 onwards.

Energy consumption and GHG emissions

Scope 1 Direct emissions by GHG type (location-based, statutory reporting) (data after amendment)

Energy/ emission type	Scope 1 emissions in metric tonnes CO ₂ e	2024	2023	2022	2021	2020	2019	Energy/ emission type	Scope 1 emissions in metric tonnes CO ₂ e	2024	2023	2022	2021	2020	2019
Industrial coal	Total	37,832	21,506	65,666	72,764	65,586	76,354	Biomethane	Total	2	–	–	–	–	–
	of CO ₂	37,445	21,286	64,961	71,981	64,884	75,553		of CO ₂	–	–	–	–	–	–
	of CH ₄	120	69	186	206	266	213		of CH ₄	–	–	–	–	–	–
	of N ₂ O	267	152	518	576	435	588		of N ₂ O	2	–	–	–	–	–
Diesel (average biofuel blend)	Total	766	721	756	904	681	1,047	Petrol (average biofuel blend)	Total	11	13	18	13	4	7
	of CO ₂	755	712	745	891	671	1,033		of CO ₂	11	13	18	13	4	7
	of CH ₄	0.09	0.08	0.08	0.09	0.07	0.12		of CH ₄	0.04	0.05	0.06	0.04	0.01	0.02
	of N ₂ O	10	9	11	13	9	14		of N ₂ O	0.03	0.04	0.06	0.04	0.01	0.02
Fuel oil	Total	89	524	512	474	393	559	Coke oven gas	Total	–	–	–	–	–	4,745
	of CO ₂	89	522	510	472	392	557		of CO ₂	–	–	–	–	–	4,745
	of CH ₄	0	1	1	1	1	1		of CH ₄	–	–	–	–	–	–
	of N ₂ O	0	1	1	1	1	1		of N ₂ O	–	–	–	–	–	–
Light diesel oil	Total	148	76	–	–	–	–	Process CO ₂	Total	57,926	29,637	91,044	100,877	88,337	106,542
	of CO ₂	146	75	–	–	–	–		of CO ₂	57,926	29,637	91,044	100,877	88,337	106,542
	of CH ₄	0	0	–	–	–	–		of CH ₄	–	–	–	–	–	–
	of N ₂ O	2	1	–	–	–	–		of N ₂ O	–	–	–	–	–	–
LPG	Total	15,355	14,655	13,924	16,563	13,222	14,214	Fugitive emissions	Total	575	1,037	2,207	1,391	1,080	985
	of CO ₂	15,333	14,634	13,904	16,539	13,204	14,196		of CO ₂	575	1,037	2,207	1,391	1,080	985
	of CH ₄	14	13	11	13	10	9		of CH ₄	–	–	–	–	–	–
	of N ₂ O	9	8	8	10	9	9		of N ₂ O	–	–	–	–	–	–
Natural gas	Total	102,886	101,746	110,557	119,268	104,487	120,410	Total	Total	215,591	169,914	284,684	312,254	273,790	324,864
	of CO ₂	102,678	101,541	110,345	119,040	104,288	120,187		of CO ₂	214,958	169,455	283,735	311,205	272,860	323,805
	of CH ₄	158	156	151	163	142	157		of CH ₄	292	238	349	383	419	381
	of N ₂ O	51	49	61	65	57	65		of N ₂ O	341	221	600	666	511	678

Notes:

- The numbers are collated from 100% of entities within the Group's Operational Control Boundary.
- 2023 includes the business of Universal Refractories Inc (Vesuvius Penn Corporation) which was acquired in 2021 and BMC (Yingkou YingWei Magnesium Co., Ltd), which was acquired late 2022.
- Past years' reporting errors of a few sites were corrected, including mainly the use of incorrect units of measure, non-production related energy consumption not reported, and some production processes not reported.

Energy consumption and GHG emissions

Scope 1 Direct emissions by GHG type (location-based, statutory reporting) (data before amendment)

Energy/ emission type	Scope 1 emissions in metric tonnes CO ₂ e	2024	2023	2022	2021	2020	2019	Energy/ emission type	Scope 1 emissions in metric tonnes CO ₂ e	2024	2023	2022	2021	2020	2019
Industrial coal	Total	37,832	21,506	65,666	72,764	65,586	76,354	Biomethane	Total	2	–	–	–	–	–
	of CO ₂	37,445	21,286	64,961	71,981	64,884	75,553		of CO ₂	–	–	–	–	–	–
	of CH ₄	120	69	186	206	266	213		of CH ₄	–	–	–	–	–	–
	of N ₂ O	267	152	518	576	435	588		of N ₂ O	2	–	–	–	–	–
Diesel (average biofuel blend)	Total	766	721	747	883	679	1,045	Petrol (average biofuel blend)	Total	11	13	18	13	4	7
	of CO ₂	755	712	737	870	669	1,031		of CO ₂	11	13	18	13	4	7
	of CH ₄	0.09	0.08	0.08	0.09	0.07	0.12		of CH ₄	0.04	0.05	0.06	0.04	0.01	0.02
	of N ₂ O	10	9	11	13	9	14		of N ₂ O	0.03	0.04	0.06	0.04	0.01	0.02
Fuel oil	Total	89	524	523	498	393	559	Coke oven gas	Total	–	–	–	–	–	4,745
	of CO ₂	89	522	521	496	392	557		of CO ₂	–	–	–	–	–	4,745
	of CH ₄	0	1	1	1	1	1		of CH ₄	–	–	–	–	–	–
	of N ₂ O	0	1	1	1	1	1		of N ₂ O	–	–	–	–	–	–
Light diesel oil	Total	148	76	–	–	–	–	Process CO ₂	Total	57,926	29,637	91,044	100,877	88,337	106,542
	of CO ₂	146	75	–	–	–	–		of CO ₂	57,926	29,637	91,044	100,877	88,337	106,542
	of CH ₄	0	0	–	–	–	–		of CH ₄	–	–	–	–	–	–
	of N ₂ O	2	1	–	–	–	–		of N ₂ O	–	–	–	–	–	–
LPG	Total	15,355	14,655	13,927	16,597	13,213	14,206	Fugitive emissions	Total	575	1,037	2,207	1,391	1,080	985
	of CO ₂	15,333	14,634	13,908	16,574	13,194	14,187		of CO ₂	575	1,037	2,207	1,391	1,080	985
	of CH ₄	14	13	11	13	10	9		of CH ₄	–	–	–	–	–	–
	of N ₂ O	9	8	8	10	9	9		of N ₂ O	–	–	–	–	–	–
Natural gas	Total	102,886	101,746	110,514	117,436	102,785	117,929	Total	Total	215,591	169,914	284,879	310,710	272,257	322,573
	of CO ₂	102,678	101,541	110,302	117,212	102,590	117,711		of CO ₂	214,958	169,455	283,930	309,665	271,330	321,519
	of CH ₄	158	156	151	160	140	154		of CH ₄	292	238	349	381	416	378
	of N ₂ O	51	49	61	64	56	64		of N ₂ O	341	221	600	665	510	677

Notes:

- The numbers are collated from 100% of entities within the Group's Operational Control Boundary.
- 2023 includes the business of Universal Refractories Inc (Vesuvius Penn Corporation) which was acquired in 2021 and BMC (Yingkou YingWei Magnesium Co., Ltd), which was acquired late 2022.

Energy consumption and GHG emissions

Fugitive emissions – coolants and refrigerants (data after amendment)

Metric tonnes CO ₂ e	2024	2023	2022	2021	2020	2019
HCFC-141b	22	4	–	–	–	39
HCFC-22/R22 = chlorodifluoromethane	190	674	1,108	808	579	646
HFC-134	–	1	2	1	–	38
HFC-134a	7	24	11	305	179	92
HFC-32	5	1	4	4	2	2
Nitrous oxide	–	–	–	–	–	5
R401A	45	67	31	–	–	–
R404A	–	16	46	27	68	53
R407A	–	72	4	4	–	–
R407C	198	82	160	37	12	20
R410A	108	95	398	148	128	90
R422B	–	–	442	59	111	–
Total	575	1,037	2,207	1,391	1,080	985

Notes:

- The numbers are collated from 100% of entities within the Group's Operational Control Boundary.
- Emissions of the following in CO₂ equivalent and in metric tonnes are not significant:
 - Direct sulphur hexafluoride (SF₆) emissions
 - Direct HFC emissions
 - Direct PFC emissions
- Re-baselined using pre-acquisition data for the business acquired from Universal Refractories, Inc. (Vesuvius Penn Corporation) and BMC (Yingkou YingWei Magnesium Co., Ltd) from 2019 onwards.
- Past years' reporting errors of a few sites were corrected, including mainly the use of incorrect units of measure, non-production related energy consumption not reported, and some production processes not reported.

Energy consumption and GHG emissions

Fugitive emissions – coolants and refrigerants (data before amendment)

Metric tonnes CO ₂ e	2024	2023	2022	2021	2020	2019
HCFC-141b	22	4	–	–	–	39
HCFC-22/R22 = chlorodifluoromethane	190	674	1,108	814	579	653
HFC-134	–	1	2	1	–	38
HFC-134a	7	24	11	305	179	92
HFC-32	5	1	4	4	2	2
Nitrous oxide	–	–	–	–	–	5
R401A	45	67	31	–	–	–
R404A	–	16	46	27	68	53
R407A	–	72	4	4	–	–
R407C	198	82	160	37	12	20
R410A	108	95	398	149	128	90
R422B	–	–	442	59	111	–
Total	575	1,037	2,207	1,398	1,080	992

- Notes:
- The numbers are collated from 100% of entities within the Group's Operational Control Boundary.
 - Emissions of the following in CO₂ equivalent and in metric tonnes are not significant:
 - Direct sulphur hexafluoride (SF₆) emissions
 - Direct HFC emissions
 - Direct PFC emissions
 - Re-baselined using pre-acquisition data for the business acquired from Universal Refractories, Inc. (Vesuvius Penn Corporation) and BMC (Yingkou YingWei Magnesium Co.,Ltd) from 2019 onwards.

Scope 1 and Scope 2 CO₂e emissions

Evolution of Scope 1 and Scope 2 CO₂e emissions (market-based) (data after amendment)

	2024 Pro forma vs 2019 %	2024 Actual vs 2019 %	2024 Pro forma	2024	2023 Pro forma	2023	2022	2021	2020	2019
CO ₂ e '000 metric tonnes			310,441	241,395	331,298	208,063	342,105	404,861	376,312	437,928
CO ₂ e metric tonnes per metric tonne of product packed for shipment	-26.9%	-40.4%	0.331	0.270	0.359	0.245	0.369	0.384	0.421	0.453
CO ₂ e metric tonnes per million £ revenue (Scope 1 & 2)	-36.5%	-50.6%	170.6	132.6	171.7	107.8	171.7	242.3	265.5	268.6

Notes:

- The numbers are collated from 100% of entities within the Group's Operational Control Boundary.
- Re-baselined using pre-acquisition data for the business acquired from Universal Refractories, Inc. (Vesuvius Penn Corporation) and BMC (Yingkou YingWei Magnesium Co.,Ltd) from 2019 onwards.
- Past years' reporting errors of a few sites were corrected, including mainly the use of incorrect units of measure, non-production related energy consumption not reported, and some production processes not reported.

Evolution of Scope 1 and Scope 2 CO₂e emissions (market-based) (data before amendment)

	2024 Pro forma vs 2019 %	2024 Actual vs 2019 %	2024 Pro forma	2024	2023 Pro forma	2023	2022	2021	2020	2019
CO ₂ e '000 metric tonnes			310,441	241,395	330,683	207,875	341,499	401,216	371,919	438,403
CO ₂ e metric tonnes per metric tonne of product packed for shipment	-26.2%	-39.9%	0.331	0.270	0.358	0.245	0.366	0.377	0.413	0.449
CO ₂ e metric tonnes per million £ revenue (Scope 1 & 2)	-36.6%	-50.7%	170.6	132.6	171.4	107.7	171.4	240.1	262.4	268.9

Notes:

- The numbers are collated from 100% of entities within the Group's Operational Control Boundary.
- Re-baselined using pre-acquisition data for the business acquired from Universal Refractories, Inc. (Vesuvius Penn Corporation) and BMC (Yingkou YingWei Magnesium Co.,Ltd) from 2019 onwards.

Scope 1 and Scope 2 CO₂e emissions

Evolution of Scope 1, Scope 2 CO₂e emissions and emissions intensity by type (market-based) (data after amendment)

	2024 Pro forma vs 2019 %	2024 Actual vs 2019 %	2024 Pro forma	2024	2023 Pro forma	2023	2022	2021	2020	2019
Total energy CO ₂ e emissions in metric tonnes			212,520	182,894	233,532	177,390	248,854	302,592	286,895	330,401
Energy CO ₂ e intensity in metric tonnes per metric tonne of product packed for shipment	-33.6%	-40.2%	0.227	0.204	0.253	0.209	0.268	0.287	0.321	0.342
Total Process CO ₂ e emissions in metric tonnes			97,015	57,926	96,729	29,637	91,044	100,877	88,337	106,542
Process CO ₂ e intensity in metric tonnes per metric tonne of product packed for shipment	-6.0%	-41.2%	0.104	0.065	0.105	0.035	0.098	0.096	0.099	0.110

Notes:

- The numbers are collated from 100% of entities within the Group's Operational Control Boundary.
- Re-baselined using pre-acquisition data for the business acquired from Universal Refractories, Inc. (Vesuvius Penn Corporation) and BMC (Yingkou YingWei Magnesium Co.,Ltd) from 2019 onwards.
- Past years' reporting errors of a few sites were corrected, including mainly the use of incorrect units of measure, non-production related energy consumption not reported, and some production processes not reported.

Evolution of Scope 1, Scope 2 CO₂e emissions and emissions intensity by type (market-based) (data before amendment)

	2024 Pro forma vs 2019 %	2024 Actual vs 2019 %	2024 Pro forma	2024	2023 Pro forma	2023	2022	2021	2020	2019
Total energy CO ₂ e emissions in metric tonnes			212,520	182,894	232,923	177,202	248,016	298,698	282,322	330,675
Energy CO ₂ e intensity in metric tonnes per metric tonne of product packed for shipment	-33.0%	-39.6%	0.227	0.204	0.252	0.209	0.265	0.281	0.314	0.339
Total Process CO ₂ e emissions in metric tonnes			97,015	57,926	96,729	29,637	91,276	101,121	88,516	106,737
Process CO ₂ e intensity in metric tonnes per metric tonne of product packed for shipment	-5.3%	-40.7%	0.104	0.065	0.105	0.035	0.098	0.095	0.098	0.109

Notes:

- The numbers are collated from 100% of entities within the Group's Operational Control Boundary.
- Re-baselined using pre-acquisition data for the business acquired from Universal Refractories, Inc. (Vesuvius Penn Corporation) and BMC (Yingkou YingWei Magnesium Co.,Ltd) from 2019 onwards.

Scope 1 and Scope 2 CO₂e emissions

Evolution of Scope 1, Scope 2 CO₂e emissions intensity (market-based and location-based) (data after amendment)

	2024	2023	2022	2021	2020	2019
CO ₂ e emissions intensity (market-based)	0.270	0.245	0.383	0.407	0.451	0.479
CO ₂ e emissions intensity (location-based)	0.341	0.306	0.430	0.427	0.452	0.480

Notes:

- The business of Universal Refractories Inc (Vesuvius Penn Corporation) which was acquired in 2021, is included in 2022 and onwards. BMC (Yingkou YingWei Magnesium Co.,Ltd), which was acquired late 2022, is included in 2023 and onwards.
- The numbers are collated from 100% of entities within the Group's Operational Control Boundary.
- Conversion factors for GHG emissions and energy used the 2024 UK Government GHG Conversion Factors for Company Reporting. Conversion factors for GHG emissions for electricity globally used the IEA Emission Factors 2024.
- Past years' reporting errors of a few sites were corrected, including mainly the use of incorrect units of measure, non-production related energy consumption not reported, and some production processes not reported.

Evolution of Scope 1, Scope 2 CO₂e emissions intensity (market-based and location-based) (data before amendment)

	2024	2023	2022	2021	2020	2019
CO ₂ e emissions intensity (market-based)	0.270	0.245	0.380	0.400	0.442	0.474
CO ₂ e emissions intensity (location-based)	0.341	0.310	0.426	0.420	0.443	0.475

Notes:

- The business of Universal Refractories Inc (Vesuvius Penn Corporation) which was acquired in 2021, is included in 2022 and onwards. BMC (Yingkou YingWei Magnesium Co.,Ltd), which was acquired late 2022, is included in 2023 and onwards.
- The numbers are collated from 100% of entities within the Group's Operational Control Boundary.
- Conversion factors for GHG emissions and energy used the 2024 UK Government GHG Conversion Factors for Company Reporting. Conversion factors for GHG emissions for electricity globally used the IEA Emission Factors 2024.

Location-based Scope 1 and Scope 2 CO₂e emissions

Only 1.4% of the total energy requirements across the Group are consumed in the UK, producing 0.9% of the Group's CO₂e location-based emissions.

Global GHG emissions and energy consumption location-based statutory reporting (Operational Control Boundary) (data after amendment)

Emissions and energy sources	UK and Offshore CO ₂ e '000 metric tonnes 2024	Global CO ₂ e '000 metric tonnes 2024	Proportion relating to the UK and Offshore Area %	UK and Offshore CO ₂ e '000 metric tonnes 2023	Global CO ₂ e '000 metric tonnes 2023	Proportion relating to the UK and Offshore Area %	UK and Offshore energy used '000 kWh 2024	Global energy used '000 kWh 2024	Proportion relating to the UK and Offshore Area %	UK and Offshore energy used '000 kWh 2023	Global energy used '000 kWh 2023	Proportion relating to the UK and Offshore Area %
Combustion of fuel and operation of facilities including fugitive emissions (Scope 1)												
	2.289	216	1.1%	2,150	170	1.3%	11,943	764,552	1.6%	11,343	699,011	1.6%
Electricity, heat, steam and cooling purchased for own use (Scope 2)												
	0.329	90	0.4%	0.339	90	0.4%	1,848	198,497	0.9%	1,905	196,612	1.0%
Total GHG emissions and energy												
	2.617	305	0.9%	2,489	260	1.0%	13,791	963,048	1.4%	13,248	895,622	1.5%
Change %												
	5.1%	17.3%					4.1%	7.5%				
Vesuvius' chosen intensity measurement (location-based statutory reporting)	Metric tonnes CO ₂ e per metric tonne of product packed for shipment					kWh of energy per metric tonne of product packed for shipment						
	UK and Offshore 2024	Global 2024		UK and Offshore 2023	Global 2023		UK and Offshore 2024	Global 2024		UK and Offshore 2023	Global 2023	
	CO ₂ e emissions intensity and energy intensity	3.123	0.341	3.441	0.306		16,457	1,076		18,315	1,054	
	Change %	-9.2%	11.4%				-10.1%	2.1%				
Total GHG emissions as metric tonnes CO ₂ e per £m revenue (location-based)	Metric tonnes of CO ₂ e per £m revenue											
	UK and Offshore 2024	Global 2024		UK and Offshore 2023	Global 2023							
	23.7	167.8		20.3	134.9							
	Change %	16.7%	24.4%									

Notes:

- Location-based Statutory Reporting of Global GHG emissions (metric tonnes of CO₂e) and energy consumption ('000 kWh). The numbers are collated from 100% of entities within the Group's Operational Control Boundary.
- The business of Universal Refractories Inc (Vesuvius Penn Corporation) which was acquired in 2021, is included in 2022 and onwards. BMC (Yingkou YingWei Magnesium Co., Ltd), which was acquired in late 2022, is included in 2023 and onwards.
- In reporting GHG emissions, we have used the GHG Protocol Corporate Accounting and Reporting Standard (revised edition) methodology to identify our location-based GHG inventory of Scope 1 (direct) and Scope 2 (indirect) CO₂e. We report in metric tonnes of CO₂ equivalent (CO₂e). We have used emission factors from the UK Government's (Defra) and the IEA GHG Conversion Factors for Company Reporting 2024 in the calculation of our GHG emissions.
- Our energy-related greenhouse gas (GHG) emissions, reported as carbon dioxide equivalents (CO₂e), include direct emissions of the three main GHGs: carbon dioxide (CO₂), methane (CH₄) and nitrous oxide (N₂O).
- Process related emissions of the following in CO₂ equivalent and in metric tonnes are not significant: Direct methane CH₄ emissions and Direct nitrous oxide N₂O emissions.
- Emissions of the following in CO₂ equivalent and in metric tonnes are not significant: Direct sulphur hexafluoride (SF₆) emissions; Direct HFC emissions; and Direct PFC emissions.
- Past years' reporting errors of a few sites were corrected, including mainly the use of incorrect units of measure, non-production related energy consumption not reported, and some production processes not reported.

Location-based Scope 1 and Scope 2 CO₂e emissions

Only 1.4% of the total energy requirements across the Group are consumed in the UK, producing 0.9% of the Group's CO₂e location-based emissions.

Global GHG emissions and energy consumption location-based statutory reporting (Operational Control Boundary) (data before amendment)

Emissions and energy sources	UK and Offshore CO ₂ e '000 metric tonnes 2024	Global CO ₂ e '000 metric tonnes 2024	Proportion relating to the UK and Offshore Area %	UK and Offshore CO ₂ e '000 metric tonnes 2023	Global CO ₂ e '000 metric tonnes 2023	Proportion relating to the UK and Offshore Area %	UK and Offshore energy used '000 kWh 2024	Global energy used '000 kWh 2024	Proportion relating to the UK and Offshore Area %	UK and Offshore energy used '000 kWh 2023	Global energy used '000 kWh 2023	Proportion relating to the UK and Offshore Area %
Combustion of fuel and operation of facilities including fugitive emissions (Scope 1)	2.289	216	1.1%	2,150	170	1.3%	11,943	764,552	1.6%	11,343	699,011	1.6%
Electricity, heat, steam and cooling purchased for own use (Scope 2)	0.329	90	0.4%	0.385	93	0.4%	1,848	198,497	0.9%	1,905	196,612	1.0%
Total GHG emissions and energy	2.617	305	0.9%	2.54	263	1.0%	13,791	963,048	1.4%	13,248	895,622	1.5%
Change %	3.2%	16.1%					4.1%	7.5%				
Vesuvius' chosen intensity measurement (location-based statutory reporting)												
CO ₂ e emissions intensity and energy intensity	Metric tonnes CO ₂ e per metric tonne of product packed for shipment				kWh of energy per metric tonne of product packed for shipment							
	UK and Offshore 2024	Global 2024		UK and Offshore 2023	Global 2023		UK and Offshore 2024	Global 2024		UK and Offshore 2023	Global 2023	
CO ₂ e emissions intensity and energy intensity	3.123	0.341		3.50	0.310		16,457	1,076		18,315	1,054	
Change %	-10.9%	10.2%					-10.1%	2.1%				
Metric tonnes of CO ₂ e per £m revenue												
Total GHG emissions as metric tonnes CO ₂ e per £m revenue (location-based)	UK and Offshore 2024	Global 2024		UK and Offshore 2023	Global 2023							
	23.7	167.8		20.6	136.3							
Change %	14.6%	23.1%										

Notes:

- Location-based Statutory Reporting of Global GHG emissions (metric tonnes of CO₂e) and energy consumption ('000 kWh). The numbers are collated from 100% of entities within the Group's Operational Control Boundary.
- The business of Universal Refractories Inc (Vesuvius Penn Corporation) which was acquired in 2021, is included in 2022 and onwards. BMC (Yingkou YingWei Magnesium Co., Ltd), which was acquired in late 2022, is included in 2023 and onwards.
- In reporting GHG emissions, we have used the GHG Protocol Corporate Accounting and Reporting Standard (revised edition) methodology to identify our location-based GHG inventory of Scope 1 (direct) and Scope 2 (indirect) CO₂e. We report in metric tonnes of CO₂ equivalent (CO₂e). We have used emission factors from the UK Government's (Defra) and the IEA GHG Conversion Factors for Company Reporting 2024 in the calculation of our GHG emissions.
- Our energy-related greenhouse gas (GHG) emissions, reported as carbon dioxide equivalents (CO₂e), include direct emissions of the three main GHGs: carbon dioxide (CO₂), methane (CH₄) and nitrous oxide (N₂O).
- Process related emissions of the following in CO₂ equivalent and in metric tonnes are not significant: Direct methane CH₄ emissions and Direct nitrous oxide N₂O emissions.
- Emissions of the following in CO₂ equivalent and in metric tonnes are not significant: Direct sulphur hexafluoride (SF₆) emissions; Direct HFC emissions; and Direct PFC emissions.

Scope 1, Scope 2 and Scope 3 CO₂e emissions

Scope 1, Scope 2 and Scope 3 emissions (market-based)

Metric tonnes CO ₂ e	2024		2023		2022		2021		2020		2020	
	Metric tonnes	%	Metric tonnes	%	Metric tonnes	%	Metric tonnes	%	Metric tonnes	%	Metric tonnes	%
Scope 1 CO ₂ e emissions	215,591	10.8%	169,914	8.6%	284,684	14.1%	312,254	12.9%	273,790	13.4%	324,864	15.0%
Scope 1 Process CO ₂ e emissions	57,926	26.9%	29,637	17.4%	91,044	32.0%	100,877	32.3%	88,337	32.3%	106,542	32.8%
Scope 1 Energy CO ₂ e emissions	157,090	72.9%	139,241	81.9%	191,434	67.2%	209,986	67.2%	184,373	67.3%	217,337	66.9%
Scope 1 Fugitive emissions	575	0.3%	1,037	0.6%	2,207	0.8%	1,391	0.4%	1,080	0.4%	985	0.3%
Scope 2 CO ₂ e emissions (market-based)	25,804	1.3%	38,149	1.9%	56,667	2.8%	85,276	3.5%	95,220	4.7%	105,866	4.9%
Scope 3 CO ₂ e emissions	1,762,165	88.0%	1,777,008	89.5%	1,682,175	83.1%	2,030,014	83.6%	1,675,681	82.0%	1,739,044	80.1%
Total	2,003,560	100%	1,985,072	100%	2,023,526	100%	2,427,545	100%	2,044,691	100%	2,169,774	100%

Notes:

- The business of Universal Refractories Inc (Vesuvius Penn Corporation) which was acquired in 2021, is included in 2022 and onwards. BMC (Yingkou YingWei Magnesium Co., Ltd), which was acquired in late 2022, is included in 2023 and onwards.
- The numbers are collated from 100% of entities within the Group's Operational Control Boundary.
- Scope 3 based on historic data.

Scope 1, 2 and 3 CO₂e emissions (location based)

Metric tonnes CO ₂ e	2024		2023		2022		2021		2020		2020	
	tCO ₂ e	%	tCO ₂ e	%	tCO ₂ e	%	tCO ₂ e	%	tCO ₂ e	%	tCO ₂ e	%
Scope 1: natural gas, coal, LPG, company car travel, process emissions, fugitive emissions	215,591	10.8%	169,914	8.6%	284,684	14.1%	312,254	12.8%	273,790	13.4%	324,864	15.0%
Scope 2: purchased electricity location-based	89,762	4.3%	90,435	4.4%	98,877	4.8%	104,779	4.3%	96,345	4.7%	106,925	4.9%
Scope 3: business travel, electricity transmission												
Distribution; waste, supply chain (purchased goods and services) and capital goods	1,762,165	85.2%	1,777,008	87.2%	1,682,175	81.4%	2,030,014	83.0%	1,675,681	81.9%	1,739,044	80.1%
Total CO₂e emissions	2,067,518	100%	2,037,357	100%	2,065,735	100%	2,447,047	100%	2,045,816	100%	2,170,833	100%

Notes:

- The business of Universal Refractories Inc (Vesuvius Penn Corporation) which was acquired in 2021, is included in 2022 and onwards. BMC (Yingkou YingWei Magnesium Co., Ltd), which was acquired late 2022, is included in 2023 and onwards.
- The numbers are collated from 100% of entities within the Group's Operational Control Boundary.
- Conversion factors for GHG emissions and energy used the 2023 UK Government GHG Conversion Factors for Company Reporting. Conversion factors for GHG emissions for electricity globally used the IEA Emission Factors 2023.
- Calculation of Scope 3 GHG emissions used the Carbon Footprint Limited Sustrax system for years 2019–2024.

Scope 3 CO₂e emissions

Scope 3 emissions

Metric tonnes CO ₂ e	2024		2023		2022		2021		2020		2020	
	Metric tonnes	%	Metric tonnes	%	Metric tonnes	%	Metric tonnes	%	Metric tonnes	%	Metric tonnes	%
Total upstream Scope 3 CO₂e emissions	1,624,188	92%	1,624,892	91%	1,573,775	94%	1,920,763	95%	1,587,659	95%	1,654,842	95%
Purchased goods and services	1,451,402	82%	1,441,413	81%	1,381,764	82%	1,744,242	86%	1,446,188	86%	1,502,207	86%
Capital goods	46,048	3%	39,992	2%	33,369	2%	22,007	1%	19,818	1%	25,087	1%
Fuel- and energy-related activities (not included in Scope 1 or 2)	39,473	2%	37,088	2%	45,551	3%	50,931	3%	36,845	2%	42,332	2%
Upstream transportation and distribution	28,516	2%	39,086	2%	45,572	3%	39,887	2%	23,946	1%	26,104	2%
Waste generated in operations	14,391	1%	14,979	1%	15,291	1%	15,119	1%	12,927	1%	3,639	0%
Business travel	9,887	1%	11,443	1%	9,578	1%	5,128	0%	4,670	0%	10,724	1%
Employee commuting	34,470	2%	40,891	2%	42,649	3%	43,449	2%	43,265	3%	44,749	3%
Upstream leased assets	0	0%	0	0%	0	0%	0	0%	0	0%	0	0%
Total downstream Scope 3 CO₂e emissions	137,977	8%	152,116	9%	108,400	6%	109,251	5%	88,023	5%	84,203	5%
Downstream transportation and distribution	57,897	3%	80,896	5%	38,899	2%	34,912	2%	23,529	1%	25,700	1%
Processing of sold products	19,250	1%	14,924	1%	15,779	1%	14,078	1%	13,902	1%	14,371	1%
Use of sold products	37,554	2%	34,194	2%	32,914	2%	37,460	2%	31,834	2%	39,645	2%
End-of-life treatment of sold products	23,276	1%	22,103	1%	20,808	1%	22,802	1%	18,757	1%	4,487	0%
Downstream leased assets	0	0%	0	0%	0	0%	0	0%	0	0%	0	0%
Franchises	0	0%	0	0%	0	0%	0	0%	0	0%	0	0%
Investments	0	0%	0	0%	0	0%	0	0%	0	0%	0	0%
Total Scope 3 CO₂e emissions	1,762,165	100%	1,777,008	100%	1,682,175	100%	2,030,014	100%	1,675,681	100%	1,739,044	100%

Notes

- The business of Universal Refractories Inc (Vesuvius Penn Corporation) which was acquired in 2021, is included in 2022 and onwards. BMC (Yingkou YingWei Magnesium Co., Ltd), which was acquired late 2022, is included in 2023 and onwards.
- The numbers are collated from 100% of entities within the Group's Operational Control Boundary.
- Conversion factors for GHG emissions and energy used the 2024 UK Government GHG Conversion Factors for Company Reporting. Conversion factors for GHG emissions for electricity globally used the IEA Emission Factors 2024.
- Calculation of Scope 3 GHG emissions used the Carbon Footprint Limited Sustrax system for years 2019–2024.

Scope 3 reporting – comments on methodology

Since 2023, Vesuvius has implemented the Sustrax platform to evaluate Scope 3 emissions. The Sustrax tool relies on the UK Government Defra (formerly DBEIS) methodology, categories and emission conversion factors. Wherever possible we used activity data which relies on information that is specific to the organisation, and therefore is much more accurate than the spend base method.

Our Scope 3 emissions of the 2019 to 2023 period were re-evaluated using the improved new approach to ensure comparability over time.

Upstream / downstream	GHG Scope 3 category	Comments on the Scope 3 reporting category
Upstream	Purchased goods and services	Applies to raw materials split into more than 70 categories, each with CO ₂ e emissions factors derived from supplier data, databases, publicly available information or fallback values provided by the World Refractory Association. In 2024, we continued to increase the granularity and accuracy of the conversion factors utilised for CO ₂ e emissions calculations. Approx. 40% of emissions come from three categories of materials that undergo high-temperature processes after mining (dead burned magnesia, fused magnesia, silicon carbide).
	Capital goods	Spend based method.
	Fuel and energy-related activities, not included in Scope 1 and Scope 2	Defra Well To Tank (WTT) conversion factors applied to the quantity of energy and water consumed.
	Upstream transportation and distribution	For the 2019–2022 period, spend based method used in the absence of activity data. For 2024, CO ₂ emissions data received from our forwarders covered 26% of our transportation spend; operational data and Defra conversion factors were used to evaluate CO ₂ emissions covering 61% of our transportation spend; the remainder (13%) was estimated based on spend and Defra conversion factors.
	Waste generated in operations	Defra conversion factor for landfill applied to the waste tonnage reported by all manufacturing sites. Defra methodology and conversion factors were changed between 2019 and 2020.
	Business travel	Spend based method. Travel and entertainment spend extracted from financial systems, estimated to be 50% generated by travel and 50% by accommodation services.
	Employee commuting	Collective transportation of 2,111 employees and directly supervised contractors is organised by Vesuvius. Based on survey, the remainder assumed to commute 20 miles daily using petrol-fuelled medium-sized light vehicles. Our software provider corrected a bug in their system which resulted in employee commuting not including return journeys. As a consequence, employee commuting related emissions for all years from 2019 to 2023 have been doubled.
	Upstream leased assets	None. All offices reported under Scope 1 and Scope 2.

Scope 3 reporting – comments on methodology

Upstream / downstream	GHG Scope 3 category	Comments on the Scope 3 reporting category
Downstream	Downstream transportation	<p>For the 2019–2022 period, spend based method used in the absence of activity data.</p> <p>For 2024, CO₂ emissions data received from our forwarders covered 26% of our transportation spend; operational data and Defra conversion factors were used to evaluate CO₂ emissions covering 61% of our transportation spend; the remainder (13%) was estimated based on spend and Defra conversion factors.</p>
	Processing of sold products	<p>Spend based method.</p> <p>Based on internal survey, covers products sold by Vesuvius requiring customer processing (preheating or drying) during installation or before usage by the customer.</p> <p>Total spend extrapolated from the actual energy consumption and spend measured at selected customers.</p>
	Use of sold products	<p>Our products are used by customers whose processes emit significant amounts of CO₂. They serve to contain and protect liquid metal and manage its flow, but do not participate in the heating operations or chemical reactions that lead to CO₂ emissions. Emissions associated with the processing or use of our products are hence very limited. More specifically:</p> <p>Refractory materials do not require energy during their use; having undergone high-temperature processes during their manufacturing, they are inert and do not release any greenhouse gases during their use.</p> <p>Some non-refractory products contain chemicals, which will be partially burnt during usage by our customers. Direct emissions from the partial burning of one family of non-refractory products was estimated. The calculated emission factor was applied to all non-refractory products.</p>
	End of life of sold products	<p>More than 95% of revenue is generated by the sale of consumable products. We estimate that 33% of the consumable products is consumed in the customers' process, 25% is recycled internally by customers, 37% is recycled externally, and 5% is disposed of in landfilling. The Defra emission factor for landfill is applied to this tonnage.</p> <p>Less than 5% of revenue is generated by the sale of capital goods which are disposed of as scrap steel or recycled.</p>
	Downstream leased assets	None.
	Franchises	None.
	Investments	Minority share in one electronic and software company with fewer than ten employees is considered de minimus.

Raw materials and waste

Raw materials and waste (data after amendment)

Manufacturing site raw materials and waste/(metric tonnes)	2024 vs 2019 %	2024	2023	2022	2021	2020	2019
Raw materials							
Recycled materials used (from external sources)	-1.5%	69,255	65,734	64,477	74,501	58,426	70,299
Recovered materials used (from external sources)	0.0%	0	0	0	0	0	0
Raw materials and intermediates used excluding recycled (from external sources)	-11.3%	992,732	928,588	1,065,456	1,201,426	1,005,533	1,119,402
Total raw materials and intermediates used	-10.7%	1,061,987	994,322	1,129,933	1,275,927	1,063,959	1,189,701
% recycled materials (from external sources)	9.8%	6.5%	6.6%	5.7%	5.8%	5.5%	5.9%
% recovered materials (from external sources)	0.0%	0%	0%	0%	0%	0%	0%
Waste (solid waste, by-products and wastewater)							
Solid waste and by-products	-36.7%	50,185	53,989	67,785	60,809	61,393	79,224
Ratio of solid waste and by-products in metric tonnes per tonne of product packed for shipment	-31.5%	0.056	0.064	0.073	0.058	0.069	0.082
Total non-recycled waste (solid waste, hazardous and sent to landfill)	-24.2%	27,658	28,787	32,743	32,371	28,213	36,480
– Non-hazardous waste	-26.6%	23,085	24,210	27,944	28,303	24,528	31,470
– Tailings waste	0.0%	0	0	0	0	0	0
– Hazardous waste	-8.7%	4,573	4,577	4,799	4,067	3,684	5,010
– Toxic waste	249.3%	26	22	20	51	32	7
– Other hazardous waste	-9.1%	4,548	4,554	4,779	4,016	3,652	5,003
– Ratio of hazardous waste to total solid waste	20.4%	16.5%	15.9%	14.7%	12.6%	13.1%	13.7%
Ratio of solid waste per tonne of product packed for shipment (in metric tonnes)	-18.0%	0.031	0.034	0.035	0.031	0.032	0.038
By-products (recycled waste)	-47.3%	22,527	25,202	35,042	28,438	33,181	42,744
Ratio of by-products per tonne of product packed for shipment (in metric tonnes)	-43.0%	0.025	0.030	0.038	0.027	0.037	0.044
Ratio of by-product to total solid waste (%)	-16.8%	44.9%	46.7%	51.7%	46.8%	54.0%	54.0%
Wastewater	-30.2%	208,200	248,179	268,625	300,601	272,674	298,378
Ratio of wastewater per tonne of product packed for shipment (in metric tonnes)	-24.6%	0.233	0.292	0.290	0.285	0.305	0.309
Total solid waste, by-products and wastewater	-31.6%	258,385	302,168	336,410	361,410	334,068	377,602

Notes:

- The numbers are collated from 100% of entities within the Group's Operational Control Boundary.
- 1m³ wastewater = 1 metric tonne.
- Re-baselined using pre-acquisition data for the business acquired from Universal Refractories, Inc. (Vesuvius Penn Corporation) and BMC (Yingkou YingWei Magnesium Co.,Ltd) from 2019 onwards. For 2019 and earlier the management joint venture with Anshan Angang Vesuvius Refractory Company Ltd is not included as this was outside the Operational Control Boundary.
- Some of Vesuvius sites include social water in the wastewater reporting.
- Past years' reporting errors of a few sites were corrected, including mainly the reclassification of social water and adjustment of missing or excessive reporting of solid waste records.

Raw materials and waste

Raw materials and waste (data before amendment)

Manufacturing site raw materials & waste/(metric tonnes)	2024 vs 2019 %	2024	2023	2022	2021	2020	2019
Raw materials							
Recycled materials used (from external sources)	1.3%	69,255	65,497	66,137	76,482	57,035	68,373
Recovered materials used (from external sources)	0.0%	0	0	0	0	0	0
Raw materials and intermediates used excluding recycled (from external sources)	-12.6%	992,732	931,970	1,071,494	1,210,339	1,015,865	1,136,024
Total raw materials and intermediates used	-11.8%	1,061,987	997,467	1,137,631	1,286,821	1,072,900	1,204,398
% recycled materials (from external sources)	14.5%	6.5%	6.5%	5.8%	5.9%	5.3%	5.7%
% recovered materials (from external sources)	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Waste (solid waste, by-products and wastewater)							
Solid waste and by-products	-37.4%	50,185	53,700	67,937	60,722	60,788	80,209
Ratio of solid waste and by-products in metric tonnes per tonne of product packed for shipment	-31.7%	0.056	0.063	0.073	0.057	0.068	0.082
Total non-recycled waste (solid waste, hazardous and sent to landfill)	-27.0%	27,658	28,543	32,954	32,399	27,604	37,894
– Non-hazardous waste	-30.2%	23,085	24,236	28,179	28,377	23,997	33,089
– Tailings waste	0.0%	0	0	0	0	0	0
– Hazardous waste	-4.8%	4,573	4,307	4,775	4,022	3,608	4,805
– Toxic waste	249.3%	26	22	20	51	32	7
– Other hazardous waste	-5.2%	4,548	4,284	4,755	3,971	3,575	4,798
– Ratio of hazardous waste to total solid waste	30.4%	16.5%	15.1%	14.5%	12.4%	13.1%	12.7%
Ratio of solid waste per tonne of product packed for shipment (in metric tonnes)	-20.3%	0.031	0.034	0.035	0.030	0.031	0.039
By-products (recycled waste)	-46.8%	22,527	25,158	34,983	28,322	33,184	42,315
Ratio of by-products per tonne of product packed for shipment (in metric tonnes)	-41.9%	0.025	0.030	0.037	0.027	0.037	0.043
Ratio of by-product to total solid waste (%)	-14.9%	44.9%	46.8%	51.5%	46.6%	54.6%	52.8%
Wastewater	-22.3%	208,200	223,767	240,605	266,944	245,906	267,922
Ratio of wastewater per tonne of product packed for shipment (in metric tonnes)	-15.1%	0.233	0.263	0.258	0.251	0.273	0.274
Total solid waste, by-products and wastewater	-25.8%	258,385	277,467	308,542	327,665	306,694	348,131

Notes:

– The numbers are collated from 100% of entities within the Group's Operational Control Boundary.

– 1m³ wastewater = 1 metric tonne.

– Re-baselined using pre-acquisition data for the business acquired from Universal Refractories, Inc. (Vesuvius Penn Corporation) and BMC (Yingkou YingWei Magnesium Co.,Ltd) from 2019 onwards. For 2019 and earlier the management joint venture with Anshan Angang Vesuvius Refractory Company Ltd is not included as this was outside the Operational Control Boundary.

Water

Water stress (data after amendment)

Location of manufacturing sites	Number of main manufacturing sites, end of 2024	Percentage of revenue						Manufacturing sites fresh water use (m³)					
		2024	2023	2022	2021	2020	2019	2024	2023	2022	2021	2020	2019
Very high water stress	4	5	4	4	4	4	4	69,971	81,322	65,643	56,393	48,529	58,507
Moderate to high water stress	21	42	42	42	41	40	38	278,208	324,404	240,144	294,978	310,117	295,997
Low to moderate water stress	29	53	54	54	55	56	58	284,619	305,959	338,382	350,914	367,712	416,397

- Notes:
- The numbers are collated from 100% of entities within the Group's Operational Control Boundary.
 - This data covers 100% of our manufacturing sites. Water stress classification based on World Resources Institute Aqueduct Water Risk Atlas.
 - Re-baselined using pre-acquisition data for the business acquired from Universal Refractories, Inc. (Vesuvius Penn Corporation) and BMC (Yingkou YingWei Magnesium Co.,Ltd) from 2019 onwards.
 - Manufacturing sites fresh water use in 2024 presents the usage of total 58 sites (including usage of those closed in 2024).
 - Past years' reporting errors of a few sites were corrected, including mainly the reclassification of social water.

Water stress (data before amendment)

Location of manufacturing sites	Number of main manufacturing sites, end of 2024	Percentage of revenue						Manufacturing sites fresh water use (m³)					
		2024	2023	2022	2021	2020	2019	2024	2023	2022	2021	2020	2019
Very high water stress	4	5	4	4	4	4	4	69,971	81,322	65,643	56,393	48,529	58,507
Moderate to high water stress	21	42	42	42	41	40	38	278,208	327,774	242,279	269,247	286,247	293,887
Low to moderate water stress	29	53	54	54	55	56	58	284,619	326,140	366,527	379,384	366,524	425,676

- Notes:
- The numbers are collated from 100% of entities within the Group's Operational Control Boundary.
 - This data covers 100% of our manufacturing sites. Water stress classification based on World Resources Institute Aqueduct Water Risk Atlas.
 - Re-baselined using pre-acquisition data for the business acquired from Universal Refractories, Inc. (Vesuvius Penn Corporation) and BMC (Yingkou YingWei Magnesium Co.,Ltd) from 2019 onwards.
 - Manufacturing sites fresh water use in 2024 presents the usage of total 58 sites (including usage of those closed in 2024).

Water

Six-year evolution of fresh water consumption (data after amendment)

	% change 2024 vs 2019 %	2024	2023	2022	2021	2020	2019
Water in m ³	-23.69%	662,967	744,531	684,455	791,240	794,855	868,783
Water in m ³ used per metric tonne of product packed for shipment	-17.51%	0.741	0.876	0.738	0.750	0.890	0.898
Water in m ³ consumed per £million revenue	-31.66%	364	386	344	473	561	533

Notes:

- Water storage does not have a significant impact. We provide data in cubic metres (1 cubic metre = 1,000 litres = 1 metric tonne = 0.001 megalitre). Data is collected quarterly in submissions from all operations globally under the operational control of Vesuvius.
- Re-baselined using pre-acquisition data for the business acquired from Universal Refractories, Inc. (Vesuvius Penn Corporation) and BMC (Yingkou YingWei Magnesium Co.,Ltd) from 2019 onwards.
- Past years reporting errors of a few sites were corrected, including mainly the reclassification of social water.

Six-year evolution of fresh water consumption (data before amendment)

	% change 2024 vs 2019 %	2024	2023	2022	2021	2020	2019
Water in m ³	-23.05%	662,967	744,531	683,485	755,366	756,522	861,556
Water in m ³ used per metric tonne of product packed for shipment	-15.98%	0.741	0.876	0.732	0.710	0.840	0.882
Water in m ³ consumed per £million revenue	-31.08%	364	386	343	452	534	529

Notes:

- Water storage does not have a significant impact. We provide data in cubic metres (1 cubic metre = 1,000 litres = 1 metric tonne = 0.001 megalitre). Data is collected quarterly in submissions from all operations globally under the operational control of Vesuvius.
- Re-baselined using pre-acquisition data for the business acquired from Universal Refractories, Inc. (Vesuvius Penn Corporation) and BMC (Yingkou YingWei Magnesium Co.,Ltd) from 2019 onwards.

ISO 14001:2015 certifications

Country	Company name
Australia	Fosco Pty Ltd
Belgium	Vesuvius Belgium N.V.
Brazil	Fosco Industrial e Comercial Ltda
Czech Republic	Vesuvius Česká republika, a.s.
Egypt	Vesuvius Mid East Ltd.
Egypt	Vesuvius Mid East Ltd.
Germany	Vesuvius GmbH
Germany	Vesuvius GmbH
Germany	SIR Feuerfestprodukte GmbH
Germany	Vesuvius Mülheim GmbH
Germany	Vesuvius Europe GmbH
Germany	SIR Feuerfestprodukte GmbH
China	Yingkou Bayuquan Refractories Co., Ltd
China	Vesuvius Advanced Ceramic (China) Co., Ltd.
China	Wuhan Wugang Vesuvius Advanced Ceramics Co., Ltd
China	Wuhan Wugang-Vesuvius Advanced CCR Co., Ltd.
China	Yingkou Yingwei Magnesium Co., Ltd
India	Vesuvius India Limited
India	Fosco India Limited
India	Fosco India Limited
India	Vesuvius India Limited
India	Vesuvius India Limited

Country	Company name
Indonesia	P.T.Fosco Indonesia
Japan	Fosco Japan Limited
Malaysia	Vesuvius Malaysia Sdn Bhd
Mexico	Vesuvius Mexico, S. A. de C. V.
Mexico	Vesuvius Mexico, S.A. de C.V.
Netherlands	Fosco Nederland BV
Poland	Vesuvius Poland Sp. z o.o.
Republic of Korea	Fosco Korea Limited
Republic of South Africa	Vesuvius South Africa (Pty) Limited
Sweden	Vesuvius Scandinavia AB FOSECO
Taiwan	Fosco Golden Gate Co. Limited
UAE	Vesuvius RAK
United Kingdom	Vesuvius UK Limited

EU taxonomy

The European Regulation 2020/852 and the Delegated Act Climate of the Taxonomy Regulation 2021/2139 included no sector-specific guidance regarding the eligibility and technical screening criteria for the alignment for the refractory industry (NACE code '23.20 Manufacture of refractory products' is not listed in Annex I or Annex II of the Taxonomy regulation).

Vesuvius has therefore relied on the principles laid out in the Taxonomy Regulation and its own judgement to assess the eligibility of its activities.

The six environmental objectives were considered when defining the criteria applied in our assessment:

1. Climate change mitigation
2. Climate change adaptation
3. Sustainable use and protection of water and marine resources
4. Circular economy transition
5. Pollution and prevention control
6. Biodiversity and ecosystem protection and restoration

A portion of Vesuvius' economic activities falls into the category 'manufacture of other low-carbon technologies' as defined by the Annex I and II of the

Delegated Regulation (EU) 2021/2139, and in particular into the sub-category of 'Manufacture of technologies aimed at substantial GHG emission reductions in other sectors of the economy', and as such can be considered as eligible. Five main families of products and services were identified in the review of Vesuvius' activities:

- Products for usage in sustainable end-markets (e.g. solar, electric vehicles, windmills)
- Products sold to customers in downstream activities with processes recognised as eligible in the EU taxonomy (e.g. EAF steel-making, DRI, secondary aluminium production, electric melting of grey iron)
- Product ranges that offer significant sustainability performance advantages over alternative product ranges (e.g. unshaped refractories which do not require firing as an alternative to fired bricks)
- Recycled products (e.g. remanufactured slide-gates)
- Enabling technologies and systems to help customers optimise their sustainability performance (e.g. lasers, gunning robots, smart degassing units)

Close to market research, development and innovation

Vesuvius R&D activities also satisfy the definition of 'research, applied research and experimental development of solutions, processes, technologies, business models and other products dedicated to the reduction, avoidance or removal of GHG emissions (RD&I) for which the ability to reduce, remove or avoid GHG emissions in the target economic activities has at least been demonstrated in a relevant environment, corresponding to at least Technology Readiness Level (TRL) 6'.

Key Performance Indicators

The share of revenue, operating expenditure and capital expenditure that can be assigned to taxonomy-eligible activities was evaluated. (100% of Vesuvius' activities were considered.) Whenever activities fell into multiple categories, data was removed from one of them, to avoid double-counting.

In the absence of Technical Screening Criteria, Vesuvius has been actively participating within the European Refractories Producers Association (PRE) to propose a set of criteria applicable to our industrial sector.

EU taxonomy disclosure table

		Revenue	Operating expenditure	Capital expenditure ²
Manufacture of other low-carbon technologies	£ million	412	7 ¹	15
	%	23%	22%	18%
Close to market research, development and innovation	£ million		10	2
	%		4	2%
Total	£ million	412	81	16
	%	23%	25%	20%

1. Non-R&D operating expenses is not allocated to specific activities. Instead, we manage our operating expenses by function across all activities, either globally, within the Business Units, or at regional Business Unit level. Consequently, they are broadly in proportion with the level of revenue of each activity.

2. Most of our capital expenditure will be utilised to manufacture both eligible and not eligible products under the EU taxonomy. All categories of capital expenditure were analysed to best evaluate the percentage that could be allocated to EU eligible activities.

Vesuvius Sustainability Policies and Standards

Health and Safety Policies and Standards

Accident & Incident Reporting	Reviewed 2024
Anti-Bribery and Corruption Policy	Reviewed 2024
Biodiversity Policy	Issued 2022
Business Continuity Planning	Issued 2018
Business Continuity Policy	Issued 2018
Code of Conduct	Reviewed 2020
Conflict Minerals Policy	Issued 2022
Control of Contractors	Reviewed 2022
Customer Location	Reviewed 2021
Crisis Management & Crisis Communication Policy	Reviewed 2019
Data Protection Privacy notice	Reviewed 2021
Data Protection Policy	Reviewed 2024
Diversity and Equality Policy	Issued 2019
Drug and Alcohol Policy	Reviewed 2024
Environmental Policy	Reviewed 2024
Ergonomics	Reviewed 2022
Executive Safety Tour	Reviewed 2024
Explosive Dust and Powder Process Safety	Reviewed 2022
Gas Safety	Issued 2015
Health and Safety Policy	Reviewed 2024
High-Risk Activities	Reviewed 2024
Homeworking	Issued 2024
Housekeeping	Reviewed 2023
Human Rights and Labour Policy	Reviewed 2022

Health and Safety Policies and Standards

Inspection, Maintenance and Testing of Fixed Electrical Installations	Reviewed 2018
Isostatic Presses	Issued 2020
Lifting and Handling	Reviewed 2023
Lock, Tag and Try	Reviewed 2024
Machine Safety	Reviewed 2024
Occupational Health	Issued 2024
On-site Vehicle Operations	Issued 2020
Overtime Policy	Reviewed 2024
Permit to Work	Reviewed 2019
Personal Protective Equipment	Reviewed 2021
Plant Colour Standard	Issued 2019
Process Safety	Issued 2020
Purchasing Policy	Reviewed 2017
Road Safety	Reviewed 2020
Risk Assessment	Reviewed 2023
Speak Up Policy	Reviewed 2024
Storage	Reviewed 2024
Sustainability Charter	Issued 2020
Sustainable Procurement Policy	Reviewed 2023
Working with Third Parties Policy	Issued 2018

See also www.vesuvius.com for selected documents.

Vesuvius safety training programmes

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
- Explosive Powder and Dust Safety
- 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
- Human Organisational
- Performance Training
- Improving the Quality of Safety Audits
- ISO 45001:2018
- Legionella
- Lift Planning
- Lock, Tag and Try
- Incident and Performance Reporting
- Machine Safety
- Permit to Work
- Personal Protective Equipment Safety
- Project Management
- Practical Safety in Steel Customers
- Radiation
- Road Safety
- Safe Stacking
- Safety and Environmental Auditing
- Safety Culture and Behaviour Based Safety Training
- Safety Tour Training
- Safe Working on Roofs
- Steel Mill Orientation
- TurboS Safety and Safety Leadership
- Warehouse Material Stacking and Handling
- Welding Certification
- Working at Height

Safety performance

Safety performance five-year table with main performance indicators

All employees, contractors and visitors

Performance indicators	2024	2023	2022	2021	2020	2019
Work-related deaths	0	0	1	0	0	0
Severe injuries	4	5	6	3	4	0
Lost Time Injuries (LTI)	16	17	30	29	28	40
LTI Frequency Rate (LTIFR) per million hours	0.52	0.60	1.08	1.06	1.16	1.54
Total Recordable Injuries (TRI)	56	96	113	123	126	144
Total Recordable Injury Frequency Rate (TRIFR) per million hours	1.83	3.4	4.0	4.5	5.2	5.5
Medically Treated Injuries (MTI)	63	158	184	200	164	198
MTI Frequency Rate (MTIFR) per million hours	2.1	5.6	6.6	7.3	6.8	7.6
Total number of injuries	436	410	513	627	419	520
Injury Frequency Rate (IFR) per million hours	14.2	14.5	18.4	23.0	17.3	20.0
LTI Lost Days	794	1,372	1,673	1,778	2,094	1,811
LTI Severity Frequency Rate (Lost Days) per million hours	26	49	60	65	86	70
Dangerous Occurrences (DO)	3,783	2,930	2,545	1,200	779	734
Dangerous Occurrence Frequency Rate (DOFR) per million hours	123	104	91	44	32	28
Safety audits (number)	142,050	134,728	120,670	109,176	95,315	113,440
Safety audits per 20 employees per month	17	17	16	14	14	16
Employees participating in monthly safety audits	11,458	11,212	10,500	10,047	8,559	8,804
Employees participating in monthly safety audits %	82%	83%	82%	78%	73%	75%
SIOPA	139,264	128,235	113,840	94,698	81,017	92,073
Other IOPA	26,340	24,361	27,666	26,102	29,233	30,617
IOPA total	165,604	152,596	141,506	120,800	110,250	122,690
SIOPA per employee	10	9	9	7	7	8
Other IOPA per employee	2	2	2	2	2	3
IOPA total per employee	12	11	11	9	9	10
Hours worked (thousands)	30,673	28,261	27,902	27,317	24,214	26,053

Notes:

- All frequency rates (FR) are per million hours worked.
- Severity Rate Lost Days are recorded against the month where time was lost.
- There were no visitor injuries in 2019 to 2024.
- IOPA – Improvement Opportunities closed with a permanent corrective action.
- SIOPA – Safety Improvement Opportunities closed with a permanent corrective action.
- Minor restatements of safety statistics and environmental metrics have been made for past years, with no significant effect on reported outcomes. These are due to error corrections and final updates of estimated data.
- Includes all sites under Vesuvius' operational control including joint ventures.

Safety performance

Safety performance 2024

Performance indicators	Employees and directly supervised contractors	Not directly supervised contractors and visitors	All employees, contractors and visitors
Work-related deaths	0	0	0
Severe injuries	4	0	4
Lost Time Injuries (LTI)	16	0	16
LTI Frequency Rate (LTIFR) per million hours	0.56	0	0.52
Total Recordable Injuries (TRI)	56	0	56
Total Recordable Injuries Frequency Rate (TRIFR) per million hours	2.0	0	1.8
Medically Treated Injuries (MTI)	63	0	63
MTI Frequency Rate (MTIFR) per million hours	2.2	0	2.1
Total number of injuries	418	18	436
Injury Frequency Rate (IFR) per million hours	14.7	7.8	14.2
LTI Lost Days	794	0	794
LTI Severity Frequency Rate (Lost Days) per million hours	28	0	26
Dangerous Occurrences (DO)	3,780	3	3,783
Dangerous Occurrence Frequency Rate (DOFR)	133	1	123
Safety audits (number)	142,050	0	142,050
Safety audits per 20 employees per month	17	0	17
Employees participating in monthly safety audits	11,458	0	11,384
Employees participating in monthly safety audits %	82%	0%	82%
SIOPA	139,264	0	139,179
Other IOPA	26,340	0	26,340
IOPA total	165,604	0	165,519
SIOPA per employee	10	0	10
Other IOPA per employee	2	0	2
IOPA total per employee	12	0	12
Hours worked (thousands)	28,354	2,319	30,673

- Notes:
- All frequency rates (FR) are per million hours worked.
 - Severity Rate Lost Days are recorded against the month where to time was lost.
 - There were no visitor injuries in 2019 to 2024.
 - IOPA – Improvement Opportunities closed with a permanent corrective action.
 - SIOPA – Safety Improvement Opportunities closed with a permanent corrective action.
 - Minor restatements of safety statistics and environmental metrics have been made for past years, with no significant effect on reported outcomes. These are due to error corrections and final updates of estimated data.
 - Includes all sites under Vesuvius' operational control including joint ventures.
 - Not directly supervised contractors and visitors 2024: 898 (2023: 696).

Vesuvius employee distribution

In our sustainability annual reporting, we collect employees’ data counts from our global HR systems. The consolidated data is aggregated at the Group level, considering all legal entities.

Methodology:

We report headcount information as 31 December 2024. The headcount is standardised regardless of the employment contract type. At Vesuvius, the employee headcount type is classified in the following three broad categories:

1. Permanent
2. Temporary
3. Non-Employee

A broader description of each type is as follows:

1. Permanent: Individuals who have employment contracts with Vesuvius and/or are paid via Vesuvius payroll.
2. Temporary: Individuals who have fixed employment contracts with Vesuvius and/or are paid via Vesuvius payroll.
3. Non-Employee: Individuals who are engaged at Vesuvius through a civil contract or non-employment contract or through an agent.

Active headcount demographics in 2024

By age group, 15% of employees were under 30 years old, 63% were between 30-50 years old, and 22% were over 50 years old.

Vesuvius employee distribution

Vesuvius employee distribution

	2024	2024 %	2023	2023 %	2022	2022 %	2021	2021 %
Vesuvius employees	11,133	81%	11,376	84%	10,837	84%	10,657	85%
Directly supervised contractors	2,582	19%	2,135	16%	2,331	16%	1,939	15 %
Total	13,715	100%	13,511	100%	13,168	100%	12,596	100%

Notes:

– In addition to the headcount figures above, Vesuvius used the services of 134 contractors and consultants in 2021, 222 in 2022 and 166 in 2023 to work on specific short-term projects.

2024 distribution of Vesuvius employees – full-time versus part-time

	Full-time employees	Full-time employees (%)	Part-time employees	Part-time employees (%)	Total	Total (%)
Permanent salaried	4,534	42%	42	0%	4,576	43%
Permanent hourly	6,141	57%	17	0%	6,158	57%
Total permanent	10,675	96%	59	95%	10,734	96%
Temporary salaried	32	0%	2	3%	34	4%
Temporary hourly	364	3%	1	2%	365	5%
Total temporary	396	4%	3	5%	399	4%
Total	11,071	99%	62	1%	11,133	100%

2020–2024 distribution of Vesuvius employees – full-time versus part-time

	2024				2023				2022				2021				2020			
	Full-time employees	Full-time employees (%)	Part-time employees	Part-time employees (%)	Full-time employees	Full-time employees (%)	Part-time employees	Part-time employees (%)	Full-time employees	Full-time employees (%)	Part-time employees	Part-time employees (%)	Full-time employees	Full-time employees (%)	Part-time employees	Part-time employees (%)	Full-time employees	Full-time employees (%)	Part-time employees	Part-time employees (%)
Permanent salaried	4,534	42%	42	0%	4,642	40.8%	53	0.5%	4,391	39.4%	48	0.4%	4,086	36.9%	43	0.4%	3,905	37.7%	53	0.5%
Permanent hourly	6,141	57%	17	0%	6,290	55.3%	16	0.1%	5,939	53.3%	12	0.1%	5,878	53.1%	6	0.1%	5,647	54.5%	7	0.1%
Total permanent	10,675	96%	59%	95%	10,932	96.0%	69	0.6%	10,330	92.8%	60	0.5%	9,964	90.0%	49	0.4%	9,552	92.3%	60	0.6%
Temporary salaried	32	0%	2	3%	43	0.4%	2	0.0%	86	0.8%	3	0.0%	90	0.8%	1	0.0%	64	0.6%	2	0.0%
Temporary hourly	364	3%	1	2%	327	2.9%	3	0.0%	649	5.8%	6	0.1%	966	8.7%	6	0.1%	674	6.5%	2	0.0%
Total temporary	396	4%	3%	5%	370	3.3%	5	0.0%	735	6.6%	9	0.1%	1,056	9.5%	7	0.1%	738	7.1%	4	0.0%
Total	11,071	99%	62%	1%	11,302	99.3%	74	0.7%	11,065	99.4%	69	0.6%	11,020	99.5%	56	0.5%	10,290	99.4%	64	0.6%

2024 distribution of Vesuvius employees by gender – full-time versus part-time

	Total					Male				Female			
	Full-time employees	Full-time employees (%)	Part-time employees	Part-time employees (%)	Unknown	Full-time employees	Full-time employees (%)	Part-time employees	Part-time employees (%)	Full-time employees	Full-time employees (%)	Part-time employees	Part-time employees (%)
Permanent salaried	4,534	42%	42	71%	1	3,423	38%	10	37%	1,110	72%	32	100%
Permanent hourly	6,141	58%	17	29%	1	5,698	62%	17	63%	442	28%	0	0%
Total permanent	10,675	96%	59	95%	2	9,121	97%	27	90%	1,552	95%	32	91%
Temporary salaried	32	8%	2	67%	–	18	6%	2	67%	14	16%	2	67%
Temporary hourly	364	3%	1	2%	1	288	94%	1	33%	75	84%	1	33%
Total temporary	396	4%	3	5%	1	306	3%	3	10%	89	5%	3	9%
Total	11,071	100%	62	100%	3	9,427	100%	30	100%	1,641	100%	35	100%

ESRS Standards and GRI Content Index

ESRS Standards

In this ESRS index table, we list disclosures on which we have reported to date.

GRI Statement of use

Vesuvius plc has reported in accordance with the GRI Standards for the period 1 January 1 2022 to 31 December 2024. GRI 1 used: GRI 1 Foundation 2021 Applicable GRI Sector Standard(s): none.

ESRS	DR	Paragraph	Related Application Requirement	Name	Location (shared and individual references)	GRI Standard	Disclosure	Name
ESRS 2	BP-1	3		Disclosure of general basis for preparation of sustainability statement	Page 128			
ESRS 2	BP-1	5a		Basis for preparation of sustainability statement	Pages 5, 128, 137	GRI 2	2-2	List all its entities included in its sustainability reporting
ESRS 2	BP-1	5b i		Scope of consolidation of consolidated sustainability statement is same as for financial statements	Page 128	GRI 2	2-2	If the organization has audited consolidated financial statements or financial information filed on public record, specify the differences between the list of entities included in its financial reporting and the list included in its sustainability reporting
ESRS 2	BP-1	5b ii		Indication of subsidiary undertakings included in consolidation that are exempted from individual or consolidated sustainability reporting	Page 128			
ESRS 2	BP-1	5c	AR 1	Disclosure of extent to which sustainability statement covers upstream and downstream value chain	Page 129	GRI 3	3-1	How the organization has identified actual and potential, negative and positive impacts on the economy, environment, and people, including impacts on their human rights, across its activities and business relationships
ESRS 2	BP-1	5d		Option to omit specific piece of information corresponding to intellectual property, know-how or results of innovation has been used	Not reported			
ESRS 2	BP-1	5e		Option allowed by Member State to omit disclosure of impending developments or matters in course of negotiation has been used	Not reported			
ESRS 2	BP-2	6		Disclosures in relation to specific circumstances	Not reported			
ESRS 2	BP-2	9		Medium- or long-term time horizons defined by ESRS 1 have been deviated from	Not reported			
ESRS 2	BP-2	9a		Disclosure of definitions of medium- or long-term time horizons	Not reported			
ESRS 2	BP-2	9b		Disclosure of reasons for applying different definitions of time horizons	Not reported			
ESRS 2	BP-2	10		Metrics include value chain data estimated using indirect sources	Pages 119-120			
ESRS 2	BP-2	10a		Disclosure of metrics that include value chain data estimated using indirect sources	Pages 119-120			
ESRS 2	BP-2	10b		Description of basis for preparation of metrics that include value chain data estimated using indirect sources	Pages 119-120			
ESRS 2	BP-2	10c		Description of resulting level of accuracy of metrics that include value chain data estimated using indirect sources	Not reported			

ESRS Standards and GRI Content Index

ESRS	DR	Paragraph	Related Application Requirement	Name	Location (shared and individual references)	GRI Standard	Disclosure	Name
ESRS 2	BP-2	10d		Description of planned actions to improve accuracy in future of metrics that include value chain data estimated using indirect sources	Pages 119, 160 Partially reported			
ESRS 2	BP-2	11a		Disclosure of quantitative metrics and monetary amounts disclosed that are subject to high level of measurement uncertainty	Not reported			
ESRS 2	BP-2	11b i		Disclosure of sources of measurement uncertainty	Not reported			
ESRS 2	BP-2	11b ii 12		Disclosure of assumptions, approximations and judgements made in measurement	Pages 5, 128, 142, 160-161			
ESRS 2	BP-2	13a		Explanation of changes in preparation and presentation of sustainability information and reasons for them	Pages 5, 128, 142, 160-161, 170-171	GRI 2	2-4	Explain the reasons for the restatements
ESRS 2	BP-2	13b		Disclosure of revised comparative figures	Pages 5, 128, 142, 160-161, 170-171	GRI 2	2-4	Report restatements of information made from previous reporting periods
ESRS 2	BP-2	13c		Disclosure of difference between figures disclosed in preceding period and revised comparative figures	Pages 5, 128, 142, 160-161, 170-171	GRI 2	2-4	Explain the effect of the restatements
ESRS 2	BP-2	14a		Disclosure of nature of prior period material errors	Pages 5, 128, 142, 160-161, 170-171	GRI 2	2-4	Explain the reasons for the restatements
ESRS 2	BP-2	14b		Disclosure of corrections for prior periods included in sustainability statement	Not reported	GRI 2	2-4	Report restatements of information made from previous reporting periods
ESRS 2	BP-2	14c		Disclosure of why correction of prior period errors is not practicable	Not reported			
ESRS 2	BP-2	15		Disclosure of other legislation or generally accepted sustainability reporting standards and frameworks based on which information has been included in sustainability statement	Not applicable			
ESRS 2	BP-2	15		Disclosure of reference to paragraphs of standard or framework applied	Not reported			
ESRS 2	BP-2	16		List of DRs or DPs mandated by a Disclosure Requirement	Not reported			
ESRS 2	BP-2	17		Topics (E4, S1, S2, S3, S4) have been assessed to be material	Pages 28-29, 131, 136	GRI 3	3-2	List the organization's material topics
ESRS 2	BP-2	17a		List of sustainability matters assessed to be material (phase-in)	Pages 28-29, 131, 136	GRI 3	3-2	List the organization's material topics
ESRS 2	BP-2	17b		Description of any time-bound targets set related to sustainability matters assessed to be material (phase-in) and progress made towards achieving those targets	Pages 22, 137	GRI 3	3-3	Targets used to evaluate progress; progress toward the targets
ESRS 2	BP-2	17c		Description of policies related to sustainability matters assessed to be material (phase-in)	Pages 31, 74, 88, 91, 102-3, 106, 111-113, 115, 125, 127, 168	GRI 3	3-3	Describe the organization's policies or commitments regarding the material topic
ESRS 2	BP-2	17d		Description of actions taken to identify, monitor, prevent, mitigate, remediate or bring end to actual or potential adverse impacts related to sustainability matters assessed to be material (phase-in) and result of such actions	Pages 47-49, 55-65, 69-72, 75-79, 88-90, 94-98, 101-105, 108-109	GRI 3	3-3	Describe actions taken to manage the topic and related impacts, including: actions to prevent or mitigate potential negative impacts; actions to address actual negative impacts, including actions to provide for or cooperate in their remediation; actions to manage actual and potential positive impacts; the effectiveness of the actions
ESRS 2	BP-2	17e		Disclosure of metrics related to sustainability matters assessed to be material (phase-in)	Pages 22, 42, 137	GRI 3	3-3	Indicators used to evaluate progress

ESRS Standards and GRI Content Index

ESRS	DR	Paragraph	Related Application Requirement	Name	Location (shared and individual references)		GRI Standard	Disclosure	Name
ESRS 2	GOV-1	21		Information about composition and diversity of members of administrative, management and supervisory bodies	Pages 107, 125-126		GRI 2	2-9	Describe the composition of the highest governance body and its committees by: tenure of members on the governance body
ESRS 2	GOV-1	21a		Number of executive members	Annual Report page 84		GRI 2	2-9	Describe the composition of the highest governance body and its committees by: executive and non-executive members
ESRS 2	GOV-1	21a		Number of non-executive members	Annual Report page 84		GRI 2	2-9	Describe the composition of the highest governance body and its committees by: executive and non-executive members
ESRS 2	GOV-1	21b		Information about representation of employees and other workers	Page 126		GRI 2	2-9	Describe the composition of the highest governance body and its committees by: stakeholder representation
ESRS 2	GOV-1	21c	AR 5	Information about member's experience relevant to sectors, products and geographic locations of undertaking	Annual Report pages 76-80		GRI 2	2-9	Describe the composition of the highest governance body and its committees by: competencies relevant to the impacts of the organization
ESRS 2	GOV-1	21d		Percentage of members of administrative, management and supervisory bodies	Annual Report pages 76-80		GRI 2	2-9	Describe the composition of the highest governance body and its committees by: gender; under-represented social groups
					Annual Report pages 76-80		GRI 405	405-1	Percentage of individuals within the organization's governance bodies in each of the following diversity categories: gender; age group: under 30 years old, 30-50 years old, over 50 years old; other indicators of diversity where relevant (such as minority or vulnerable groups)
ESRS 2	GOV-1	21d		Board's gender diversity ratio	Page 107 Annual Report pages 99-101		GRI 2	2-9	Describe the composition of the highest governance body and its committees by: gender
					Pages 107, 173		GRI 405	405-1	Percentage of individuals within the organization's governance bodies in each of the following diversity categories: gender
ESRS 2	GOV-1	21e		Percentage of independent board members	Page 83		GRI 2	2-9	Describe the composition of the highest governance body and its committees by: independence
ESRS 2	GOV-1	22	AR 3	Information about roles and responsibilities of administrative, management and supervisory bodies	Annual Report pages 80-83, 85-87	Pages 39, 80, 127	GRI 2	2-14	Report whether the highest governance body is responsible for reviewing and approving the reported information, including the organization's material topics, and if so, describe the process for reviewing and approving the information; if the highest governance body is not responsible for reviewing and approving the reported information, including the organization's material topics, explain the reason for this
ESRS 2	GOV-1	22a		Information about identity of administrative, management and supervisory bodies or individual(s) within body responsible for oversight of impacts, risks and opportunities	Page 125 Annual Report pages 79-129		GRI 2	2-9	List the committees of the highest governance body that are responsible for decision-making on and overseeing the management of the organization's impacts on the economy, environment, and people
ESRS 2	GOV-1	22b		Disclosure of how body's or individuals within body responsibilities for impacts, risks and opportunities are reflected in undertaking's terms of reference, board mandates and other related policies	Annual Report pages 79-82				
ESRS 2	GOV-1	22c		Description of management's role in governance processes, controls and procedures used to monitor, manage and oversee impacts, risks and opportunities	Annual Report pages 33, 79-82, 84		GRI 2	2-12	Describe the role of the highest governance body in overseeing the organization's due diligence and other processes to identify and manage the organization's impacts on the economy, environment, and people

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ESRS	DR	Paragraph	Related Application Requirement	Name	Location (shared and individual references)	GRI Standard	Disclosure	Name
ESRS 2	GOV-1	22c i		Description of how oversight is exercised over management-level position or committee to which management's role is delegated to	Annual Report pages 33, 79-82, 84	GRI 2	2-13	Describe how the highest governance body delegates responsibility for managing the organization's impacts on the economy, environment, and people, including whether it has appointed any senior executives with responsibility for the management of impacts; whether it has delegated responsibility for the management of impacts to other employees
ESRS 2	GOV-1	22c ii		Information about reporting lines to administrative, management and supervisory bodies	Page 125 Annual Report page 84	GRI 2	2-13	Describe the process and frequency for senior executives or other employees to report back to the highest governance body on the management of the organization's impacts on the economy, environment, and people
ESRS 2	GOV-1	22c iii		Disclosure of how dedicated controls and procedures are integrated with other internal functions	Page 125			
ESRS 2	GOV-1	22d		Disclosure of how administrative, management and supervisory bodies and senior executive management oversee setting of targets related to material impacts, risks and opportunities and how progress towards them is monitored	Pages 125-126, 137			
ESRS 2	GOV-1	23	AR 5	Disclosure of how administrative, management and supervisory bodies determine whether appropriate skills and expertise are available or will be developed to oversee sustainability matters	Annual Report pages 87-88, 99	GRI 2	2-17	Report measures taken to advance the collective knowledge, skills, and experience of the highest governance body on sustainable development
ESRS 2	GOV-1	23a		Information about sustainability-related expertise that bodies either directly possess or can leverage	Annual Report pages 87-88	GRI 2	2-9	Describe the composition of the highest governance body and its committees by: competencies relevant to the impacts of the organization
ESRS 2	GOV-1	23b		Disclosure of how sustainability-related skills and expertise relate to material impacts, risks and opportunities	Page 127 Annual Report pages 87-88	GRI 2	2-9	Describe the composition of the highest governance body and its committees by: competencies relevant to the impacts of the organization
ESRS 2	GOV-2	26a		Disclosure of whether, by whom and how frequently administrative, management and supervisory bodies are informed about material impacts, risks and opportunities, implementation of due diligence, and results and effectiveness of policies, actions, metrics and targets adopted to address them	Pages 125-127	GRI 2	2-12	How the highest governance body considers the outcomes of these processes due diligence and other processes to identify and manage the organization's impacts; describe the role of the highest governance body in reviewing the effectiveness of the organization's processes as described in 2-12-b, and report the frequency of this review
					Page 125 Annual Report page 84	GRI 2	2-13	Describe the process and frequency for senior executives or other employees to report back to the highest governance body on the management of the organization's impacts on the economy, environment, and people
					Pages 125-127	GRI 2	2-16	Describe whether and how critical concerns are communicated to the highest governance body
ESRS 2	GOV-2	26b		Disclosure of how administrative, management and supervisory bodies consider impacts, risks and opportunities when overseeing strategy, decisions on major transactions and risk management process	Pages 125-127, 137	GRI 2	2-12	Describe the role of the highest governance body and of senior executives in developing, approving, and updating the organization's purpose, value or mission statements, strategies, policies, and goals related to sustainable development
					Pages 125-127, 137	GRI 2	2-24	How the organization integrates the commitments into organizational strategies, operational policies, and operational procedures
ESRS 2	GOV-2	26c		Disclosure of list of material impacts, risks and opportunities addressed by administrative, management and supervisory bodies or their relevant committees	Pages 136-137 Page 126	GRI 2	2-16	Report the total number and the nature of critical concerns that were communicated to the highest governance body during the reporting period

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ESRS	DR	Paragraph	Related Application Requirement	Name	Location (shared and individual references)		GRI Standard	Disclosure	Name
ESRS 2	GOV-3	29	AR 7	Incentive schemes and remuneration policies linked to sustainability matters for members of administrative, management and supervisory bodies exist	Page 125		GRI 2	2-19	Describe how the remuneration policies for members of the highest governance body and senior executives relate to their objectives and performance in relation to the management of the organization's impacts on the economy, environment, and people
ESRS 2	GOV-3	29a		Description of key characteristics of incentive schemes	Annual Report pages 103-105	Page 125	GRI 2	2-19	Describe how the remuneration policies for members of the highest governance body and senior executives relate to their objectives and performance in relation to the management of the organization's impacts on the economy, environment, and people
ESRS 2	GOV-3	29b		Description of specific sustainability-related targets and (or) impacts used to assess performance of members of administrative, management and supervisory bodies	Annual Report page 104	Page 125	GRI 2	2-19	Describe how the remuneration policies for members of the highest governance body and senior executives relate to their objectives and performance in relation to the management of the organization's impacts on the economy, environment, and people
ESRS 2	GOV-3	29c		Disclosure of how sustainability-related performance metrics are considered as performance benchmarks or included in remuneration policies	Annual Report page 104	Page 125	GRI 2	2-19	Describe how the remuneration policies for members of the highest governance body and senior executives relate to their objectives and performance in relation to the management of the organization's impacts on the economy, environment, and people
ESRS 2	GOV-3	29d		Percentage of variable remuneration dependent on sustainability-related targets and (or) impacts	Annual Report pages 104-105				
ESRS 2	GOV-3	29e		Description of level in undertaking at which terms of incentive schemes are approved and updated	Annual Report pages 103-105		GRI 2	2-20	Describe the process for designing the organization's remuneration policies and for determining remuneration, including: whether independent highest governance body members or an independent remuneration committee oversees the process for determining remuneration
ESRS 2	GOV-4	30; 32	AR 8-AR 10	Disclosure of mapping of information provided in sustainability statement about due diligence process	Pages 68, 73, 92, 112, 114, 126 Annual Report pages 33, 61				
ESRS 2	GOV-5	36a	AR 11	Description of scope, main features and components of risk management and internal control processes and systems in relation to sustainability reporting	Pages 27-28, 139	Pages 39, 80, 127	GRI 2	2-14	Report whether the highest governance body is responsible for reviewing and approving the reported information, including the organization's material topics, and if so, describe the process for reviewing and approving the information; if the highest governance body is not responsible for reviewing and approving the reported information, including the organization's material topics, explain the reason for this
ESRS 2	GOV-5	36b	AR 11	Description of risk assessment approach followed	Page 28	Pages 39, 80, 127	GRI 2	2-14	Report whether the highest governance body is responsible for reviewing and approving the reported information, including the organization's material topics, and if so, describe the process for reviewing and approving the information; if the highest governance body is not responsible for reviewing and approving the reported information, including the organization's material topics, explain the reason for this

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ESRS	DR	Paragraph	Related Application Requirement	Name	Location (shared and individual references)		GRI Standard	Disclosure	Name
ESRS 2	GOV-5	36c	AR 11	Description of main risks identified and their mitigation strategies	Pages 33-43, 74, 132-135	Pages 39, 80, 127	GRI 2	2-14	Report whether the highest governance body is responsible for reviewing and approving the reported information, including the organization's material topics, and if so, describe the process for reviewing and approving the information; if the highest governance body is not responsible for reviewing and approving the reported information, including the organization's material topics, explain the reason for this
ESRS 2	GOV-5	36d	AR 11	Description of how findings of risk assessment and internal controls as regards sustainability reporting process have been integrated into relevant internal functions and processes	Pages 33-43, 74, 132-135	Pages 39, 80, 127	GRI 2	2-14	Report whether the highest governance body is responsible for reviewing and approving the reported information, including the organization's material topics, and if so, describe the process for reviewing and approving the information; if the highest governance body is not responsible for reviewing and approving the reported information, including the organization's material topics, explain the reason for this
ESRS 2	GOV-5	36e	AR 11	Description of periodic reporting of findings of risk assessment and internal controls to administrative, management and supervisory bodies	Page 127	Pages 39, 80, 127	GRI 2	2-14	Report whether the highest governance body is responsible for reviewing and approving the reported information, including the organization's material topics, and if so, describe the process for reviewing and approving the information; if the highest governance body is not responsible for reviewing and approving the reported information, including the organization's material topics, explain the reason for this
ESRS 2	SBM-1	40	AR 12-13	Disclosure of information about key elements of general strategy that relate to or affect sustainability matters	Page 4				
ESRS 2	SBM-1	40a i	AR 12-13	Description of significant groups of products and (or) services offered	Pages 3, 7-12, 14		GRI 2	2-6	Describe the organization's products, services; describe significant changes in 2-6-b compared to the previous reporting period
ESRS 2	SBM-1	40a ii	AR 12-13	Description of significant markets and (or) customer groups served	Pages 9-12		GRI 2	2-6	Describe the organization's markets served; describe significant changes in 2-6-b compared to the previous reporting period
ESRS 2	SBM-1	40a iii	AR 12-13	Total number of employees (head count)	Page 107		GRI 2	2-7	Report the total number of employees, and a breakdown of this total by region
ESRS 2	SBM-1	40a iii	AR 12-13	Number of employees (head count)	Page 107		GRI 2	2-7	Report the total number of employees, and a breakdown of this total by region
ESRS 2	SBM-1	40a iv	AR 12-13	Description of products and services that are banned in certain markets	Not reported				
ESRS 2	SBM-1	40b	AR 12-13	Total revenue	Page 9				
ESRS 2	SBM-1	40b	AR 12-13	Revenue by ESRS Sectors	Page 9	Pages 7-8, 11	GRI 2	2-6	Report the sector(s) in which the organization is active
ESRS 2	SBM-1	40c	AR 12-13	List of additional significant ESRS sectors in which significant activities are developed or in which undertaking is or may be connected to material impacts	Page 12	Pages 7-8, 11	GRI 2	2-6	Report the sector(s) in which the organization is active
ESRS 2	SBM-1	40d i	AR 12-13	Undertaking is active in fossil fuel (coal, oil and gas) sector	Page 15				
ESRS 2	SBM-1	40d i	AR 12-13	Revenue from fossil fuel (coal, oil and gas) sector	Not reported				
ESRS 2	SBM-1	40d i	AR 12-13	Revenue from coal	Not reported				
ESRS 2	SBM-1	40d i	AR 12-13	Revenue from oil	Not reported				

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ESRS	DR	Paragraph	Related Application Requirement	Name	Location (shared and individual references)	GRI Standard	Disclosure	Name
ESRS 2	SBM-1	40d i	AR 12-13	Revenue from gas	Not reported			
ESRS 2	SBM-1	40d i	AR 12-13	Revenue from Taxonomy-aligned economic activities related to fossil gas	Not reported			
ESRS 2	SBM-1	40d ii	AR 12-13	Undertaking is active in chemicals production	Pages 13, 76 No chemical products are sold by Vesuvius plc			
ESRS 2	SBM-1	40d ii	AR 12-13	Revenue from chemicals production	Not reported			
ESRS 2	SBM-1	40d iii	AR 12-13	Undertaking is active in controversial weapons	Not reported			
ESRS 2	SBM-1	40d iii	AR 12-13	Revenue from controversial weapons	Not reported			
ESRS 2	SBM-1	40d iv	AR 12-13	Undertaking is active in cultivation and production of tobacco	Not reported			
ESRS 2	SBM-1	40d iv	AR 12-13	Revenue from cultivation and production of tobacco	Not reported			
ESRS 2	SBM-1	40e	AR 12-13	Description of sustainability-related goals in terms of significant groups of products and services, customer categories, geographical areas and relationships with stakeholders	Pages 22, 71, 77	GRI 3	3-3	Report goals used to evaluate progress
ESRS 2	SBM-1	40f	AR 12-13	Disclosure of assessment of current significant products and (or) services, and significant markets and customer groups, in relation to sustainability-related goals	Pages 22, 71, 77			
ESRS 2	SBM-1	40g	AR 12-13	Disclosure of elements of strategy that relate to or impact sustainability matters	Pages 5, 10-12	GRI 2	2-22	Report a statement from the highest governance body or most senior executive of the organization about the relevance of sustainable development to the organization and its strategy for contributing to sustainable development
ESRS 2	SBM-1	41		List of ESRS sectors that are significant for undertaking	Pages 13-14			
ESRS 2	SBM-1	42	AR 14	Description of business model and value chain	Pages 12-15	GRI 2	2-6	Describe the organization's value chain, including the organization's activities; the organization's supply chain; the entities downstream from the organization and their activities; report other relevant business relationships; describe significant changes in 2-6-b and 2-6-c compared to the previous reporting period
ESRS 2	SBM-1	42a		Description of inputs and approach to gathering, developing and securing inputs	Pages 13-15, 18			
ESRS 2	SBM-1	42b		Description of outputs and outcomes in terms of current and expected benefits for customers, investors and other stakeholders	Pages 15, 17, 25, 69-70, 75			
ESRS 2	SBM-1	42c	AR 15	Description of main features of upstream and downstream value chain and undertakings position in value chain	Pages 12-15	GRI 2	2-6	Describe the organization's value chain, including; the organization's supply chain; the entities downstream from the organization and their activities; report other relevant business relationships; describe significant changes in 2-6-b and 2-6-c compared to the previous reporting period
ESRS 2	SBM-2	45a	AR 16	Description of stakeholder engagement	Pages 16-20	GRI 2	2-29	Describe the organization's approach to engaging with stakeholders
ESRS 2	SBM-2	45a i	AR 16	Description of key stakeholders	Pages 16-20	GRI 2	2-29	The categories of stakeholders the organization engages with
ESRS 2	SBM-2	45a ii	AR 16	Description of categories of stakeholders for which engagement occurs	Pages 16-20	GRI 2	2-29	The categories of stakeholders the organization engages with

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ESRS	DR	Paragraph	Related Application Requirement	Name	Location (shared and individual references)		GRI Standard	Disclosure	Name
ESRS 2	SBM-2	45a iii	AR 16	Description of how stakeholder engagement is organised	Pages 16-20, 29, 130		GRI 2	2-29	Describe the organization's approach to engaging with stakeholders
ESRS 2	SBM-2	45a iv	AR 16	Description of purpose of stakeholder engagement	Pages 16-20, 130		GRI 2	2-29	The purpose of the stakeholder engagement
ESRS 2	SBM-2	45a v	AR 16	Description of how outcome of stakeholder engagement is taken into account	Pages 16-20, 130				
ESRS 2	SBM-2	45b	AR 16	Description of understanding of interests and views of key stakeholders as they relate to undertaking's strategy and business model	Pages 130-131				
ESRS 2	SBM-2	45c		Description of amendments to strategy and (or) business model	Pages 136-138				
ESRS 2	SBM-2	45c i		Description of how strategy and (or) business model have been amended or are expected to be amended to address interests and views of stakeholders	Pages 136-138				
ESRS 2	SBM-2	45c ii		Description of any further steps that are being planned and in what timeline	Pages 137-138				
ESRS 2	SBM-2	45c iii		Further steps that are being planned are likely to modify relationship with and views of stakeholders	Pages 137-138				
ESRS 2	SBM-2	45d		Description of how administrative, management and supervisory bodies are informed about views and interests of affected stakeholders with regard to sustainability-related impacts	Pages 125-127		GRI 2	2-12	Describe whether and how the highest governance body engages with stakeholders to support these processes due diligence and other processes to identify and manage the organization's impacts
ESRS 2	SBM-3	48a		Description of material impacts resulting from materiality assessment	Pages 132-137	Page 136	GRI 3	3-2	List the organization's material topics
						Pages 36-37, 132, 138-140	GRI 201	201-2	A description of the impact associated with the risk or opportunity posed by climate change
						Pages 58, 60, 133	GRI 306	306-1	For the organization's significant actual and potential waste-related impacts, a description of: the inputs, activities, and outputs that lead or could lead to these impacts; whether these impacts relate to waste generated in the organization's own activities or to waste generated upstream or downstream in its value chain
ESRS 2	SBM-3	48a		Description of material risks and opportunities resulting from materiality assessment	Pages 132-137	Pages 33-37	GRI 201	201-2	Risks and opportunities posed by climate change that have the potential to generate substantive changes in operations, revenue, or expenditure
ESRS 2	SBM-3	48b		Disclosure of current and anticipated effects of material impacts, risks and opportunities on business model, value chain, strategy and decision-making, and how undertaking has responded or plans to respond to these effects	Pages 136-138				
ESRS 2	SBM-3	48c i		Disclosure of how material negative and positive impacts affect (or are likely to affect) people or environment	Pages 132-135		GRI 3	3-3	Describe the actual and potential, negative and positive impacts on the economy, environment, and people, including impacts on their human rights
ESRS 2	SBM-3	48c ii		Disclosure of how impacts originate from or are connected to strategy and business model	Pages 13-15				
ESRS 2	SBM-3	48c iii		Disclosure of reasonably expected time horizons of impacts	Not reported				

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ESRS	DR	Paragraph	Related Application Requirement	Name	Location (shared and individual references)		GRI Standard	Disclosure	Name
ESRS 2	SBM-3	48c iv	AR 17	Description of nature of activities or business relationships through which undertaking is involved with material impacts	Pages 13-15		GRI 3	3-3	Report whether the organization is involved with the negative impacts through its activities or as a result of its business relationships, and describe the activities or business relationships
ESRS 2	SBM-3	48d		Disclosure of current financial effects of material risks and opportunities on financial position, financial performance and cash flows and material risks and opportunities for which there is significant risk of material adjustment within next annual reporting period to carrying amounts of assets and liabilities reported in related financial statements	Pages 37-38	Page 88	GRI 2	2-27	Report the total number and the monetary value of fines for instances of non-compliance with laws and regulations that were paid during the reporting period
ESRS 2	SBM-3	48e		Disclosure of anticipated financial effects of material risks and opportunities on financial position, financial performance and cash flows over short-, medium- and long-term	Pages 37-38				
ESRS 2	SBM-3	48f		Information about resilience of strategy and business model regarding capacity to address material impacts and risks and to take advantage of material opportunities	Page 43				
ESRS 2	SBM-3	48g		Disclosure of changes to material impacts, risks and opportunities compared to previous reporting period	Page 138	Pages 136-137	GRI 3	3-2	Report changes to the list of material topics compared to the previous reporting period
ESRS 2	SBM-3	48h		Disclosure of specification of impacts, risks and opportunities that are covered by ESRS Disclosure Requirements as opposed to those covered by additional entity-specific disclosures	No entity-specific disclosure items reported				
ESRS 2	IRO-1	53a		Description of methodologies and assumptions applied in process to identify impacts, risks and opportunities	Pages 129-131				
ESRS 2	IRO-1	53b		Description of process to identify, assess, prioritise and monitor potential and actual impacts on people and environment, informed by due diligence process	Pages 129-131		GRI 3	3-1	Describe the process the organization has followed to determine its material topics
ESRS 2	IRO-1	53b i		Description of how process focuses on specific activities, business relationships, geographies or other factors that give rise to heightened risk of adverse impacts	Pages 68, 73, 92, 112, 114, 126 Annual Report pages 33, 61				
ESRS 2	IRO-1	53b ii		Description of how process considers impacts with which undertaking is involved through own operations or as result of business relationships	Pages 13-15	Pages 129-131	GRI 3	3-1	How the organization has identified actual and potential, negative and positive impacts on the economy, environment, and people, including impacts on their human rights, across its activities and business relationships
ESRS 2	IRO-1	53b iii		Description of how process includes consultation with affected stakeholders to understand how they may be impacted and with external experts	Page 130		GRI 3	3-1	Specify the stakeholders and experts whose views have informed the process of determining its material topics
ESRS 2	IRO-1	53b iv		Description of how process prioritises negative impacts based on their relative severity and likelihood and positive impacts based on their relative scale, scope and likelihood and determines which sustainability matters are material for reporting purposes	Page 130		GRI 3	3-1	How it has prioritized the impacts for reporting based on their significance
ESRS 2	IRO-1	53c		Description of process used to identify, assess, prioritise and monitor risks and opportunities that have or may have financial effects	Page 130				
ESRS 2	IRO-1	53c i		Description of how connections of impacts and dependencies with risks and opportunities that may arise from those impacts and dependencies have been considered	Page 130				

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ESRS	DR	Paragraph	Related Application Requirement	Name	Location (shared and individual references)	GRI Standard	Disclosure	Name
ESRS 2	IRO-1	53c ii		Description of how likelihood, magnitude, and nature of effects of identified risks and opportunities have been assessed	Page 130			
ESRS 2	IRO-1	53c iii		Description of how sustainability-related risks relative to other types of risks have been prioritised	Page 130 Annual Report pages 68-69			
ESRS 2	IRO-1	53d		Description of decision-making process and related internal control procedures	Annual Report page 67	GRI 2	2-14	Report whether the highest governance body is responsible for reviewing and approving the reported information, including the organization's material topics, and if so, describe the process for reviewing and approving the information; if the highest governance body is not responsible for reviewing and approving the reported information, including the organization's material topics, explain the reason for this
ESRS 2	IRO-1	53e		Description of extent to which and how process to identify, assess and manage impacts and risks is integrated into overall risk management process and used to evaluate overall risk profile and risk management processes	Page 130 Annual Report pages 68-69			
ESRS 2	IRO-1	53f		Description of extent to which and how process to identify, assess and manage opportunities is integrated into overall management process	Page 130 Annual Report pages 68-69			
ESRS 2	IRO-1	53g		Description of input parameters used in process to identify, assess and manage material impacts, risks and opportunities	Page 130			
ESRS 2	IRO-1	53h		Description of how process to identify, assess and manage impacts, risks and opportunities has changed compared to prior reporting period	Not applicable			
ESRS 2	IRO-2	56		Disclosure of list of data points that derive from other EU legislation and information on their location in sustainability statement	Not applicable			
ESRS 2	IRO-2	56	AR 19	Disclosure of list of ESRS Disclosure Requirements complied with in preparing sustainability statement following outcome of materiality assessment	Not applicable			
ESRS 2	IRO-2	57		Explanation of negative materiality assessment for ESRS E1 Climate change	Not applicable			
ESRS 2	IRO-2	59		Explanation of how material information to be disclosed in relation to material impacts, risks and opportunities has been determined	Not reported			

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ESRS	DR	Paragraph	Related Application Requirement	Name	Location (shared and individual references)		GRI Standard	Disclosure	Name
E1	E1.GOV-3	13		Disclosure of how climate-related considerations are factored into remuneration of members of administrative, management and supervisory bodies	Annual Report pages 103-105	Page 125	GRI 2	2-19	Describe how the remuneration policies for members of the highest governance body and senior executives relate to their objectives and performance in relation to the management of the organization's impacts on the economy, environment, and people
E1	E1.GOV-3	13		Percentage of remuneration recognised that is linked to climate related considerations	Annual Report page 104				
E1	E1.GOV-3	13		Explanation of climate-related considerations that are factored into remuneration of members of administrative, management and supervisory bodies	Annual Report page 104	Page 125	GRI 2	2-19	Describe how the remuneration policies for members of the highest governance body and senior executives relate to their objectives and performance in relation to the management of the organization's impacts on the economy, environment, and people
E1	E1-1	14	AR 1	Disclosure of transition plan for climate change mitigation	Pages 44-46				
E1	E1-1	16a	AR 2	Explanation of how targets are compatible with limiting of global warming to one and half degrees Celsius in line with Paris Agreement	Page 138				
E1	E1-1	16b		Disclosure of decarbonisation levers and key action	Pages 46-52				
E1	E1-1	16c		Disclosure of significant operational expenditures (OpEx) and (or) capital expenditures (CapEx) required for implementation of action plan	Pages 43-44, 46-49, 52, 167				
E1	E1-1	16c		Financial resources allocated to action plan (OpEx)	Page 46				
E1	E1-1	16c		Financial resources allocated to action plan (CapEx)	Page 46				
E1	E1-1	16d	AR 3	Explanation of potential locked-in GHG emissions from key assets and products and of how locked-in GHG emissions may jeopardise achievement of GHG emission reduction targets and drive transition risk	Pages 33, 43				
E1	E1-1	16e	AR 4	Explanation of any objective or plans (CapEx, CapEx plans, OpEx) for aligning economic activities (revenues, CapEx, OpEx) with criteria established in Commission Delegated Regulation 2021/2139	Page 167				
E1	E1-1	16f	AR 5	Significant CapEx for coal-related economic activities	Not reported				
E1	E1-1	16f	AR 5	Significant CapEx for oil-related economic activities	Not reported				
E1	E1-1	16f	AR 5	Significant CapEx for gas-related economic activities	Not reported				
E1	E1-1	16g		Undertaking is excluded from EU Paris-aligned Benchmarks	Not reported				
E1	E1-1	16h		Explanation of how transition plan is embedded in and aligned with overall business strategy and financial planning	Pages 32-33				
E1	E1-1	16i		Transition plan is approved by administrative, management and supervisory bodies	Not reported				
E1	E1-1	16j		Explanation of progress in implementing transition plan	Page 44				
E1	E1-1	17		Date of adoption of transition plan for undertakings not having adopted transition plan yet	Page 44				
E1	E1.SBM-3	18		Type of climate-related risk	Pages 33-39		GRI 201	201-2	A description of the risk or opportunity posed by climate change and its classification as either physical, regulatory, or other
E1	E1.SBM-3	19a	AR 6	Description of scope of resilience analysis	Page 43				

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ESRS	DR	Paragraph	Related Application Requirement	Name	Location (shared and individual references)	GRI Standard	Disclosure	Name
E1	E1.SBM-3	19b	AR 7a	Disclosure of how resilience analysis has been conducted	Page 41			
E1	E1.SBM-3	19b	AR 7a	Date of resilience analysis	Not reported			
E1	E1.SBM-3	AR 7b		Time horizons applied for resilience analysis	Not reported			
E1	E1.SBM-3	19c	AR 8a	Description of results of resilience analysis	Page 41			
E1	E1.SBM-3	AR 8b		Description of ability to adjust or adapt strategy and business model to climate change	Page 41			
E1	E1.IRO-1	20a, AR 9	AR 10	Description of process in relation to impacts on climate change	Pages 138-140			
E1	E1.IRO-1	20b	AR 13-AR 14	Description of process in relation to climate-related physical risks in own operations and along value chain	Pages 138-140			
E1	E1.IRO-1	AR 11a	AR 13-AR 14	Climate-related hazards have been identified over short-, medium- and long-term time horizons	Pages 138-140			
E1	E1.IRO-1	AR 11a	AR 13-AR 14	Undertaking has screened whether assets and business activities may be exposed to climate-related hazards	Pages 138-140			
E1	E1.IRO-1	AR 11b	AR 13-AR 14	Short-, medium- and long-term time horizons have been defined	Pages 138-140			
E1	E1.IRO-1	AR 11c	AR 13-AR 14	Extent to which assets and business activities may be exposed and are sensitive to identified climate-related hazards has been assessed	Pages 138-140			
E1	E1.IRO-1	AR 11d	AR 13-AR 14	Identification of climate-related hazards and assessment of exposure and sensitivity are informed by high emissions climate scenarios	Pages 138-140			
E1	E1.IRO-1	21	AR 13-AR 14	Explanation of how climate-related scenario analysis has been used to inform identification and assessment of physical risks over short, medium and long-term	Pages 138-140			
E1	E1.IRO-1	20c	AR 13-AR 14	Description of process in relation to climate-related transition risks and opportunities in own operations and along value chain	Pages 138-140			
E1	E1.IRO-1	AR 12a	AR 13-AR 14	Transition events have been identified over short-, medium- and long-term time horizons	Pages 138-140			
E1	E1.IRO-1	AR 12a	AR 13-AR 14	Undertaking has screened whether assets and business activities may be exposed to transition events	Pages 138-140			
E1	E1.IRO-1	AR 12b	AR 13-AR 14	Extent to which assets and business activities may be exposed and are sensitive to identified transition events has been assessed	Pages 138-140			
E1	E1.IRO-1	AR 12c	AR 13-AR 14	Identification of transition events and assessment of exposure has been informed by climate-related scenario analysis	Pages 138-140			
E1	E1.IRO-1	AR 12d	AR 13-AR 14	Assets and business activities that are incompatible with or need significant efforts to be compatible with transition to climate-neutral economy have been identified	Pages 138-140			
E1	E1.IRO-1	21	AR 13-AR 14	Explanation of how climate-related scenario analysis has been used to inform identification and assessment of transition risks and opportunities over short, medium and long-term	Pages 39-41, 138-140			

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ESRS	DR	Paragraph	Related Application Requirement	Name	Location (shared and individual references)	GRI Standard	Disclosure	Name
E1	E1.IRO-1	AR 15	AR 13-AR 14	Explanation of how climate scenarios used are compatible with critical climate-related assumptions made in financial statements	Pages 39-41, 138-140			
E1	E1-2	24		Policies in place to manage its material impacts, risks and opportunities related to climate change mitigation and adaptation	Pages 32-47			
E1	E1-2	25	AR 16-AR18	Sustainability matters addressed by policy for climate change	Page 52 Pages 31-32, 44, 47, 168	GRI 3	3-3	Describe its policies or commitments regarding the material topic
ESRS 2		62		Disclosures to be reported in case the undertaking has not adopted policies	Not applicable			
E1	E1-3	28		Actions and Resources related to climate change mitigation and adaptation	Pages 43-44, 46-49, 52, 167			
E1	E1-3	29a		Decarbonisation lever type	Pages 45-47			
E1	E1-3	29b		Achieved GHG emission reductions	Pages 48-51, 53-54, 158	GRI 305	305-5	GHG emissions reduced as a direct result of reduction initiatives, in metric tons of CO ₂ equivalent
E1	E1-3	29b		Expected GHG emission reductions	Not reported			
E1	E1-3	AR21		Explanation of extent to which ability to implement action depends on availability and allocation of resources	Not reported			
E1	E1-3	29ci	AR 20	Explanation of relationship of significant CapEx and OpEx required to implement actions taken or planned to relevant line items or notes in financial statements	Pages 47-50			
E1	E1-3	29cii,16c	AR 20	Explanation of relationship of significant CapEx and OpEx required to implement actions taken or planned to key performance indicators required under Commission Delegated Regulation (EU) 2021/2178	Not reported			
E1	E1-3	29ciii,16c	AR 20	Explanation of relationship of significant CapEx and OpEx required to implement actions taken or planned to CapEx plan required by Commission Delegated Regulation (EU) 2021/2178	Not reported			
E1	E1-3	AR22		Explanation of any potential differences between significant OpEx and CapEx disclosed under ESRS E1 and key performance indicators disclosed under Commission Delegated Regulation (EU) 2021/2178	Not reported			
ESRS 2		62		Disclosure to be reported if the undertaking has not adopted actions	Not reported			
E1	E1-4	32		Tracking effectiveness of policies and actions through targets	Page 45			
E1	E1-4	33		Disclosure of how GHG emissions reduction targets and (or) any other targets have been set to manage material climate-related impacts, risks and opportunities	Page 45	GRI 3	3-3	Report targets used to evaluate progress
E1	E1-4	34a + 34b	AR 23-AR 24	Tables: Multiple Dimensions (baseline year and targets; GHG Types, Scope 3 Categories, Decarbonisation levers, entity-specific denominators for intensity value)	Not reported			

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ESRS	DR	Paragraph	Related Application Requirement	Name	Location (shared and individual references)	GRI Standard	Disclosure	Name
E1	E1-4	34a + 34b		Absolute value of total Greenhouse gas emissions reduction	Page 142 Percentage change rather than absolute figures are reported, y-o-y data points are provided	GRI 305	305-5	GHG emissions reduced as a direct result of reduction initiatives, in metric tons of CO ₂ equivalent. Gases included in the calculation; whether CO ₂ , CH ₄ , N ₂ O, HFCs, PFCs, SF ₆ , NF ₃ , or all. Base year or baseline, including the rationale for choosing it. Scopes in which reductions took place; whether direct (Scope 1), energy indirect (Scope 2), and/or other indirect (Scope 3)
E1	E1-4	34a + 34b		Percentage of total Greenhouse gas emissions reduction (as of emissions of base year)	Page 157			
E1	E1-4	34a + 34b		Intensity value of total Greenhouse gas emissions reduction	Pages 155, 159			
E1	E1-4	34a + 34b		Absolute value of Scope 1 Greenhouse gas emissions reduction	Page 142 See note above for first entry of E1-4 34a + 34b	GRI 305	305-5	GHG emissions reduced as a direct result of reduction initiatives, in metric tons of CO ₂ equivalent. Gases included in the calculation; whether CO ₂ , CH ₄ , N ₂ O, HFCs, PFCs, SF ₆ , NF ₃ , or all. Base year or baseline, including the rationale for choosing it. Scopes in which reductions took place; whether direct (Scope 1), energy indirect (Scope 2), and/or other indirect (Scope 3)
E1	E1-4	34a + 34b		Percentage of Scope 1 Greenhouse gas emissions reduction (as of emissions of base year)	Pages 153-154			
E1	E1-4	34a + 34b		Intensity value of Scope 1 Greenhouse gas emissions reduction	Pages 153-155			
E1	E1-4	34a + 34b		Absolute value of location-based Scope 2 Greenhouse gas emissions reduction	Page 142 See note above for first entry of E1-4 34a + 34b	GRI 305	305-5	GHG emissions reduced as a direct result of reduction initiatives, in metric tons of CO ₂ equivalent. Gases included in the calculation; whether CO ₂ , CH ₄ , N ₂ O, HFCs, PFCs, SF ₆ , NF ₃ , or all. Base year or baseline, including the rationale for choosing it. Scopes in which reductions took place; whether direct (Scope 1), energy indirect (Scope 2), and/or other indirect (Scope 3)
E1	E1-4	34a + 34b		Percentage of location-based Scope 2 Greenhouse gas emissions reduction (as of emissions of base year)	Pages 153-154			
E1	E1-4	34a + 34b		Intensity value of location-based Scope 2 Greenhouse gas emissions reduction	Pages 153-155			
E1	E1-4	34a + 34b		Absolute value of market-based Scope 2 Greenhouse gas emissions reduction	Page 142 See note above for first entry of E1-4 34a + 34b	GRI 305	305-5	GHG emissions reduced as a direct result of reduction initiatives, in metric tons of CO ₂ equivalent. Gases included in the calculation; whether CO ₂ , CH ₄ , N ₂ O, HFCs, PFCs, SF ₆ , NF ₃ , or all. Base year or baseline, including the rationale for choosing it. Scopes in which reductions took place; whether direct (Scope 1), energy indirect (Scope 2), and/or other indirect (Scope 3)
E1	E1-4	34a + 34b		Percentage of market-based Scope 2 Greenhouse gas emissions reduction (as of emissions of base year)	Pages 153-154			
E1	E1-4	34a + 34b		Intensity value of market-based Scope 2 Greenhouse gas emissions reduction	Pages 153-155			
E1	E1-4	34a + 34b		Absolute value of Scope 3 Greenhouse gas emissions reduction	Page 142 See note above for first entry of E1-4 34a + 34b	GRI 305	305-5	GHG emissions reduced as a direct result of reduction initiatives, in metric tons of CO ₂ equivalent. Gases included in the calculation; whether CO ₂ , CH ₄ , N ₂ O, HFCs, PFCs, SF ₆ , NF ₃ , or all. Base year or baseline, including the rationale for choosing it. Scopes in which reductions took place; whether direct (Scope 1), energy indirect (Scope 2), and/or other indirect (Scope 3)

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ESRS	DR	Paragraph	Related Application Requirement	Name	Location (shared and individual references)		GRI Standard	Disclosure	Name
E1	E1-4	34a + 34b		Percentage of Scope 3 Greenhouse gas emissions reduction (as of emissions of base year)	Pages 158-159				
E1	E1-4	34a + 34b		Intensity value of Scope 3 Greenhouse gas emissions reduction	Pages 158-159				
E1	E1-4	34b		Explanation of how consistency of GHG emission reduction targets with GHG inventory boundaries has been ensured	Not reported				
					Page 141		GRI 305	305-1; 305-2; 305-3	Base year for the calculation, if applicable, including emissions in the base year; the context for any significant changes in emissions that triggered recalculations of base year emissions: base year or baseline, including the rationale for choosing it
E1	E1-4	AR 25a		Description of how it has been ensured that baseline value is representative in terms of activities covered and influences from external factors	Not applicable				
E1	E1-4	AR 25b		Description of how new baseline value affects new target, its achievement and presentation of progress over time	Page 45				
E1	E1-4	34e, 16a	AR 26	GHG emission reduction target is science based and compatible with limiting global warming to one and half degrees Celsius	Pages 45-50				
E1	E1-4	34f, 16b	AR 30	Description of expected decarbonisation levers and their overall quantitative contributions to achieve GHG emission reduction target	Pages 40-41				
E1	E1-4	AR 30c		Diverse range of climate scenarios have been considered to detect relevant environmental, societal, technology, market and policy-related developments and determine decarbonisation levers	Pages 40-41				
ESRS 2	E1-4	81		Disclosure to be reported if the undertaking has not set any measurable outcome-oriented targets	Not applicable				
E1	E1-5	37	AR 35	Total energy consumption related to own operations	Pages 36-40, 118-119	Disclosure requirement partly Not Applicable (302-1 c. iii. & iv. cooling & steam consumed, 302-1 d. iii. & iv. cooling & steam sold): no cooling or steam is purchased. No electricity, heat, cooling or steam is sold commercially. Electricity generated from our solar panels is exported to the network and re-imported where it is accounted for as electricity purchased; the amounts are insignificant, and not material	GRI 302	302-1	Total energy consumption within the organization, in joules or multiples
E1	E1-5	37a	AR 33	Total energy consumption from fossil sources	Pages 145-148		GRI 302	302-1	Total energy consumption within the organization, in joules or multiples
E1	E1-5	37b		Total energy consumption from nuclear sources	Pages 145-146		GRI 302	302-1	Total energy consumption within the organization, in joules or multiples
E1	E1-5	AR 34		Percentage of energy consumption from nuclear sources in total energy consumption	Pages 145-146				

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ESRS	DR	Paragraph	Related Application Requirement	Name	Location (shared and individual references)	GRI Standard	Disclosure	Name
E1	E1-5	37c		Total energy consumption from renewable sources	Pages 145-146	GRI 302	302-1	Total energy consumption within the organization, in joules or multiples
E1	E1-5	37ci		Fuel consumption from renewable sources	Pages 145-148	GRI 302	302-1	Total fuel consumption within the organization from renewable sources, in joules or multiples, and including fuel types used
E1	E1-5	37cii		Consumption of purchased or acquired electricity, heat, steam, and cooling from renewable sources	Pages 156-157 See note above for E1-5 37	GRI 302	302-1	In joules, watt-hours or multiples, the total electricity, heating, cooling and steam consumption
E1	E1-5	37ciii		Consumption of self-generated non-fuel renewable energy	Page 146	GRI 302	302-1	Total fuel consumption within the organization from renewable sources, in joules or multiples, and including fuel types used
E1	E1-5	AR 34		Percentage of renewable sources in total energy consumption	Pages 142, 145			
E1	E1-5	38a	AR 33	Fuel consumption from coal and coal products	Pages 142, 147-150	GRI 302	302-1	Total fuel consumption within the organization from non-renewable sources, in joules or multiples, and including fuel types used
E1	E1-5	38b	AR 33	Fuel consumption from crude oil and petroleum products	Pages 142, 147-150	GRI 302	302-1	Total fuel consumption within the organization from non-renewable sources, in joules or multiples, and including fuel types used
E1	E1-5	38c	AR 33	Fuel consumption from natural gas	Pages 142, 147-150	GRI 302	302-1	Total fuel consumption within the organization from non-renewable sources, in joules or multiples, and including fuel types used
E1	E1-5	38d	AR 33	Fuel consumption from other fossil sources	Pages 142, 147-150	GRI 302	302-1	Total fuel consumption within the organization from non-renewable sources, in joules or multiples, and including fuel types used
E1	E1-5	38e	AR 33	Consumption of purchased or acquired electricity, heat, steam, or cooling from fossil sources	Pages 156-157 See note above for E1-5 37	GRI 302	302-1	In joules, watt-hours or multiples, the total electricity, heating, cooling and steam consumption
E1	E1-5	AR 34		Percentage of fossil sources in total energy consumption	Pages 145-146			
E1	E1-5	39		Non-renewable energy production	Not reported			
E1	E1-5	39		Renewable energy production	Page 146			
E1	E1-5	40	AR 36	Energy intensity from activities in high climate impact sectors (total energy consumption per net revenue)	Not reported	GRI 302	302-3	Energy intensity ratio for the organization. Organization-specific metric (the denominator) chosen to calculate the ratio. Types of energy included in the intensity ratio; whether fuel, electricity, heating, cooling, steam, or all. Whether the ratio uses energy consumption within the organization, outside of it, or both
E1	E1-5	41		Total energy consumption from activities in high climate impact sectors	Page 142			
E1	E1-5	42		High climate impact sectors used to determine energy intensity	Not reported			
E1	E1-5	43	AR 38	Disclosure of reconciliation to relevant line item or notes in financial statements of net revenue from activities in high climate impact sectors	Not reported			

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ESRS	DR	Paragraph	Related Application Requirement	Name	Location (shared and individual references)	GRI Standard	Disclosure	Name
E1	E1-6	44	AR 39	Gross Scopes 1, 2, 3 and Total GHG emissions – GHG emissions per scope table	Pages 147-159	GRI 305	305-1	Gross direct (Scope 1) GHG emissions in metric tons of CO ₂ equivalent
					Pages 147-159	GRI 305	305-2	Gross location-based energy indirect (Scope 2) GHG emissions in metric tons of CO ₂ equivalent. If applicable, gross market-based energy indirect (Scope 2) GHG emissions in metric tons of CO ₂ equivalent
					Pages 151-152	GRI 305	305-3	Gross other indirect (Scope 3) GHG emissions in metric tons of CO ₂ equivalent
E1	E1-6	50		Gross Scopes 1, 2, 3 and Total GHG emissions – financial and operational control table	Pages 158-159			
E1	E1-6	AR 41		GHG emissions – by country, operating segments, economic activity, subsidiary, GHG category or source type	Pages 147-150			
E1	E1-6	AR 46d		Gross Scopes 1, 2, 3 and Total GHG emissions – Scope 3 GHG emissions (GHG Protocol) table	Pages 158-159			
E1	E1-6	AR 50		Gross Scopes 1, 2, 3 and Total GHG emissions – Scope 3 GHG emissions (ISO 14064-1) table	Page 54			
E1	E1-6	AR 52		Gross Scopes 1, 2, 3 and Total GHG emissions – total GHG emissions - value chain table	Pages 53, 159			
E1	E1-6	48a	AR 43	Gross Scope 1 greenhouse gas emissions	Pages 149-150	GRI 305	305-1	Gross direct (Scope 1) GHG emissions in metric tons of CO ₂ equivalent
E1	E1-6	48b	AR 44	Percentage of Scope 1 GHG emissions from regulated emission trading schemes	Page 50			
E1	E1-6	49a	AR 45	Gross location-based Scope 2 greenhouse gas emissions	Pages 156-157	GRI 305	305-2	Gross location-based energy indirect (Scope 2) GHG emissions in metric tons of CO ₂ equivalent
E1	E1-6	49b	AR 45	Gross market-based Scope 2 greenhouse gas emissions	Page 157	GRI 305	305-2	If applicable, gross market-based energy indirect (Scope 2) GHG emissions in metric tons of CO ₂ equivalent
E1	E1-6	51	AR 46	Gross Scope 3 greenhouse gas emissions	Pages 158-159	GRI 305	305-3	Gross other indirect (Scope 3) GHG emissions in metric tons of CO ₂ equivalent
E1	E1-6	44+52	AR 47	Total GHG emissions	Page 158			
E1	E1-6	44+52a	AR 47	Total GHG emissions location based	Page 158			
E1	E1-6	44+52b	AR 47	Total GHG emissions market based	Page 158			
E1	E1-6	52 a)	AR 47	Scope 2 location-based	Page 158			
E1	E1-6	52 b)	AR 47	Scope 2 market-based	Page 158			
E1	E1-6	47		Disclosure of significant changes in definition of what constitutes reporting undertaking and its value chain and explanation of their effect on year-to-year comparability of reported GHG emissions	Pages 49-52, 131, 141			
E1	E1-6	AR 39b		Disclosure of methodologies, significant assumptions and emissions factors used to calculate or measure GHG emissions	Page 142	GRI 305	305-1, 305-2; 305-3	Source of the emission factors and the global warming potential (GWP) rates used, or a reference to the GWP source. Consolidation approach for emissions; whether equity share, financial control, or operational control Scope 1 and 2. Standards, methodologies, assumptions, and/or calculation tools used

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ESRS	DR	Paragraph	Related Application Requirement	Name	Location (shared and individual references)		GRI Standard	Disclosure	Name
E1	E1-6	AR 42c		Disclosure of the effects of significant events and changes in circumstances (relevant to its GHG emissions) that occur between the reporting dates of the entities in its value chain and the date of the undertaking's general purpose financial statements	Page 50				
E1	E1-6	AR 43c		Biogenic emissions of CO ₂ from the combustion or bio-degradation of biomass not included in Scope 1 GHG emissions	Not reported		GRI 305	305-1	Biogenic CO ₂ emissions in metric tons of CO ₂ equivalent
E1	E1-6	AR 45d		Percentage of contractual instruments, Scope 2 GHG emissions	Page 50				
E1	E1-6	AR 45d		Disclosure of types of contractual instruments, Scope 2 GHG emissions	Page 50				
E1	E1-6	AR 45d		Percentage of contractual instruments used for sale and purchase of energy bundled with attributes about energy generation in relation to Scope 2 GHG emissions	Page 50				
E1	E1-6	AR 45d		Percentage of contractual instruments used for sale and purchase of unbundled energy attribute claims in relation to Scope 2 GHG emissions	Page 50				
E1	E1-6	AR 45d		Disclosure of types of contractual instruments used for sale and purchase of energy bundled with attributes about energy generation or for unbundled energy attribute claims	Page 50				
E1	E1-6	AR 45e		Biogenic emissions of CO ₂ from combustion or bio-degradation of biomass not included in Scope 2 GHG emissions	Pages 145-150				
E1	E1-6	AR 46g		Percentage of GHG Scope 3 calculated using primary data	Pages 160-161				
E1	E1-6	AR 46i		Disclosure of why Scope 3 GHG emissions category has been excluded	Page 159 (none excluded)				
E1	E1-6	AR 46i		List of Scope 3 GHG emissions categories included in inventory	Page 159		GRI 305	305-3	Other indirect (Scope 3) GHG emissions categories and activities included in the calculation
E1	E1-6	AR 46j		Biogenic emissions of CO ₂ from combustion or bio-degradation of biomass that occur in value chain not included in Scope 3 GHG emissions	Not reported		GRI 305	305-3	Biogenic CO ₂ emissions in metric tons of CO ₂ equivalent
E1	E1-6	AR 46h		Disclosure of reporting boundaries considered and calculation methods for estimating Scope 3 GHG emissions	Pages 160-161				
E1	E1-6	53	AR 53	GHG emissions intensity, location-based (total GHG emissions per net revenue)	Page 155	Pages 142, 155	GRI 305	305-4	GHG emissions intensity ratio for the organization. Organization-specific metric (the denominator) chosen to calculate the ratio. Types of GHG emissions included in the intensity ratio; whether direct (Scope 1), energy indirect (Scope 2), and/or other indirect (Scope 3)
E1	E1-6	53	AR 53	GHG emissions intensity, market-based (total GHG emissions per net revenue)	Page 155	Pages 142, 155	GRI 305	305-4	GHG emissions intensity ratio for the organization. Organization-specific metric (the denominator) chosen to calculate the ratio. Types of GHG emissions included in the intensity ratio; whether direct (Scope 1), energy indirect (Scope 2), and/or other indirect (Scope 3)
E1	E1-6	55		Disclosure of reconciliation to financial statements of net revenue used for calculation of GHG emissions intensity	Not reported				

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ESRS	DR	Paragraph	Related Application Requirement	Name	Location (shared and individual references)		GRI Standard	Disclosure	Name
E1	E1-6	55		Disclosure of reconciliation to relevant line item or notes in financial statements of net revenue amounts	Not reported				
E1	E1-6	AR 55		Net revenue	Not reported				
E1	E1-6	AR 55		Net revenue used to calculate GHG intensity	Page 50 Partially reported				
E1	E1-6	AR 55		Net revenue other than used to calculate GHG intensity	Not reported				
E1	E1-7	56a	AR 56-AR 57	Disclosure of GHG removals and storage resulting from projects developed in own operations or contributed to in upstream and downstream value chain	Pages 45, 54		GRI 305	1. Topic management organization shall explain whether offsets were used to meet the targets, including the type, amount, criteria or scheme of which the offsets are part	When reporting on GHG emissions targets, the reporting organization shall explain whether offsets were used to meet the targets, including the type, amount, criteria or scheme of which the offsets are part
E1	E1-7	56b	AR 56	Disclosure of GHG emission reductions or removals from climate change mitigation projects outside value chain financed or to be financed through any purchase of carbon credits	Pages 48-51, 53-54, 158	Page 45	GRI 305	1. Topic management organization shall explain whether offsets were used to meet the targets, including the type, amount, criteria or scheme of which the offsets are part	When reporting on GHG emissions targets, the reporting organization shall explain whether offsets were used to meet the targets, including the type, amount, criteria or scheme of which the offsets are part
					Not applicable		GRI 305	305-5	Report reductions from offsets separately
E1	E1-7	58	AR 56	Removals and carbon credits are used	Page 45		GRI 305	1. Topic management organization shall explain whether offsets were used to meet the targets, including the type	When reporting on GHG emissions targets, the reporting organization shall explain whether offsets were used to meet the targets, including the type
E1	E1-7	58a		GHG Removals and storage Activity by undertaking scope and by removal and storage activity	Not applicable		GRI 305	1. Topic management organization shall explain whether offsets were used to meet the targets, including the amount	When reporting on GHG emissions targets, the reporting organization shall explain whether offsets were used to meet the targets, including the amount
E1	E1-7	58a		Total GHG removals and storage	Not applicable		GRI 305	1. Topic management organization shall explain whether offsets were used to meet the targets, including the amount	When reporting on GHG emissions targets, the reporting organization shall explain whether offsets were used to meet the targets, including the amount
E1	E1-7	AR 58f		GHG emissions associated with removal activity	Page 50				
E1	E1-7	58b		Disclosure of calculation assumptions, methodologies and frameworks applied (GHG removals and storage)	Pages 49-50, 54, 141-142, 160-161				
E1	E1-7	AR 58e		Removal activity has been converted into carbon credits and sold on to other parties on voluntary market	Page 50				
E1	E1-7	59a		Total amount of carbon credits outside value chain that are verified against recognised quality standards and cancelled	Pages 45, 57		GRI 305	1. Topic management organization shall explain whether offsets were used to meet the targets, including the type, amount, criteria or scheme of which the offsets are part	When reporting on GHG emissions targets, the reporting organization shall explain whether offsets were used to meet the targets, including the type, amount, criteria or scheme of which the offsets are part
E1	E1-7	59b		Total amount of carbon credits outside value chain planned to be cancelled in future	Page 50				
E1	E1-7	AR 60		Reversals	Not applicable				
E1	E1-7	AR 61		Disclosure of extent of use and quality criteria used for carbon credits	Not applicable		GRI 305	1. Topic management organization shall explain whether offsets were used to meet the targets, including the criteria	When reporting on GHG emissions targets, the reporting organization shall explain whether offsets were used to meet the targets, including the criteria
E1	E1-7	AR 62a		Percentage of reduction projects	Not applicable				
E1	E1-7	AR 62a		Percentage of removal projects	Not applicable				
E1	E1-7	AR 62b		Type of carbon credits from removal projects	Not applicable		GRI 305	1. Topic management organization shall explain whether offsets were used to meet the targets, including the type	When reporting on GHG emissions targets, the reporting organization shall explain whether offsets were used to meet the targets, including the type

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ESRS	DR	Paragraph	Related Application Requirement	Name	Location (shared and individual references)	GRI Standard	Disclosure	Name
E1	E1-7	AR 62c		Percentage for recognised quality standard	Not applicable			
E1	E1-7	AR 62d		Percentage issued from projects in European Union	Not applicable			
E1	E1-7	AR 62e		Percentage that qualifies as corresponding adjustment	Not applicable			
E1	E1-7	AR 64		Date when carbon credits outside value chain are planned to be cancelled	Not applicable			
E1	E1-7	60		Explanation of scope, methodologies and frameworks applied and how residual GHG emissions are intended to be neutralised	Not applicable			
E1	E1-7	61 + 61a		Public claims of GHG neutrality that involve use of carbon credits have been made	Not applicable	GRI 305	1. Topic management disclosures	When reporting on GHG emissions targets, the reporting organization shall explain whether offsets were used to meet the targets
E1	E1-7	61b		Claims of GHG neutrality and reliance on carbon credits neither impede nor reduce achievement of GHG emission reduction targets or net zero target	Not applicable			
E1	E1-7	61a, b		Explanation of how public claims of GHG neutrality that involve use of carbon credits are accompanied by GHG emission reduction targets and how claims of GHG neutrality and reliance on carbon credits neither impede nor reduce achievement of GHG emission reduction targets or net zero target	Not applicable	GRI 305	1. Topic management disclosures	When reporting on GHG emissions targets, the reporting organization shall explain whether offsets were used to meet the targets
E1	E1-7	61c		Explanation of credibility and integrity of carbon credits used	Not applicable			
E1	E1-7	AR 62		Percentage for recognised quality standards	Not applicable			
E1	E1-8	63a		Carbon pricing scheme by type	Page 48			
E1	E1-8	63a		Type of internal carbon pricing scheme	Page 48			
E1	E1-8	63b		Description of specific scope of application of carbon pricing scheme	Page 48			
E1	E1-8	63c		Carbon price applied for each metric tonne of greenhouse gas emission	Page 48			
E1	E1-8	63c		Description of critical assumptions made to determine carbon price applied	Page 48			
E1	E1-8	63d		Percentage of gross Scope 1 greenhouse gas emissions covered by internal carbon pricing scheme	Not reported			
E1	E1-8	63d		Percentage of gross Scope 2 greenhouse gas emissions covered by internal carbon pricing scheme	Not reported			
E1	E1-8	63d		Percentage of gross Scope 3 greenhouse gas emissions covered by internal carbon pricing scheme	Not reported			
E1	E1-8	AR 65		Disclosure of how carbon price used in internal carbon pricing scheme is consistent with carbon price used in financial statements	Not reported			
E1	E1-9	66a	AR 70	Assets at material physical risk before considering climate change adaptation actions	Page 34 Partially reported			
E1	E1-9	66a	AR 70	Assets at acute material physical risk before considering climate change adaptation actions	Pages 35-36 Partially reported			
E1	E1-9	66a	AR 70	Assets at chronic material physical risk before considering climate change adaptation actions	Pages 35-36 Partially reported			

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ESRS	DR	Paragraph	Related Application Requirement	Name	Location (shared and individual references)	GRI Standard	Disclosure	Name
E1	E1-9	66a	AR 70	Percentage of assets at material physical risk before considering climate change adaptation actions	Page 34 Partially reported			
E1	E1-9	66a	AR 70	Disclosure of location of significant assets at material physical risk	Pages 35-36			
E1	E1-9	AR 70c i)		Disclosure of location of its significant assets at material physical risk (disaggregated by NUTS codes)	Pages 35-36 Partially reported			
E1	E1-9	66b		Percentage of assets at material physical risk addressed by climate change adaptation actions	Not reported			
E1	E1-9	66c		Disclosure of location of significant assets at material physical risk	Pages 35-36			
E1	E1-9	66d	AR 71	Net revenue from business activities at material physical risk	Not reported			
E1	E1-9	66d	AR 71	Percentage of net revenue from business activities at material physical risk	Pages 37, 43			
E1	E1-9	AR 69a		Disclosure of how anticipated financial effects for assets and business activities at material physical risk have been assessed	Pages 138-140			
E1	E1-9	AR 69b		Disclosure of how assessment of assets and business activities considered to be at material physical risk relies on or is part of process to determine material physical risk and to determine climate scenarios	Pages 138-140			
E1	E1-9	67a		Assets at material transition risk before considering climate mitigation actions	Pages 37-39	GRI 201	201-2	The financial implications of the risk or opportunity posed by climate change before action is taken
E1	E1-9	67a		Percentage of assets at material transition risk before considering climate mitigation actions	Page 34 Partially reported			
E1	E1-9	67b		Percentage of assets at material transition risk addressed by climate change mitigation actions	Not reported			
E1	E1-9	67c		Total carrying amount of real estate assets	Not applicable			
E1	E1-9	AR 72a, AR 73a		Disclosure of how potential effects on future financial performance and position for assets and business activities at material transition risk have been assessed	Pages 39-43			
E1	E1-9	AR 72b		Disclosure of how assessment of assets and business activities considered to be at material transition risk relies on or is part of process to determine material transition risks and to determine scenarios	Pages 39-43			
E1	E1-9	AR 73a		Estimated amount of potentially stranded assets	Not reported			
E1	E1-9	AR 73a		Percentage of estimated share of potentially stranded assets of total assets at material transition risk	Not reported			
E1	E1-9	AR 73b		Total carrying amount of real estate assets for which energy consumption is based on internal estimates	Not applicable			
E1	E1-9	67d		Liabilities from material transition risks that may have to be recognised in financial statements	Pages 35-36			
E1	E1-9	67e		Net revenue from business activities at material transition risk	Not reported			
E1	E1-9	67e		Net revenue from customers operating in coal-related activities	Not reported			

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ESRS	DR	Paragraph	Related Application Requirement	Name	Location (shared and individual references)	GRI Standard	Disclosure	Name
E1	E1-9	67e		Net revenue from customers operating in oil-related activities	Not reported			
E1	E1-9	67e		Net revenue from customers operating in gas-related activities	Not reported			
E1	E1-9	67e		Percentage of net revenue from customers operating in coal-related activities	Not reported			
E1	E1-9	67e		Percentage of net revenue from customers operating in oil-related activities	Not reported			
E1	E1-9	67e		Percentage of net revenue from customers operating in gas-related activities	Not reported			
E1	E1-9	68a		Disclosure of reconciliations with financial statements of significant amounts of assets and net revenue at material physical risk	Not reported			
E1	E1-9	68b		Disclosure of reconciliations with financial statements of significant amounts of assets, liabilities and net revenue at material transition risk	Not reported			
E1	E1-9	69a	AR 80	Expected cost savings from climate change mitigation actions	Pages 79 Partially reported	GRI 201	201-2	The financial implications of the risk or opportunity posed by climate change before action is taken
E1	E1-9	69a	AR 80	Expected cost savings from climate change adaptation actions	Not reported	GRI 201	201-2	The financial implications of the risk or opportunity posed by climate change before action is taken
E1	E1-9	69b	AR 81	Potential market size of low-carbon products and services or adaptation solutions to which undertaking has or may have access	Page 71			
E1	E1-9	69b	AR 81	Expected changes to net revenue from low-carbon products and services or adaptation solutions to which undertaking has or may have access	Not reported			

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ESRS	DR	Paragraph	Related Application Requirement	Name	Location (shared and individual references)	GRI Standard	Disclosure	Name
S1	SBM-3	14	AR 6-AR 7	All people in its own workforce who can be materially impacted by undertaking are included in scope of disclosure under ESRS 2	Page 81			
S1	SBM-3	14a		Description of types of employees and non-employees in its own workforce subject to material impacts	Page 82			
S1	SBM-3	14b		Material negative impacts occurrence (own workforce)	Page 82			
S1	SBM-3	14c		Description of activities that result in positive impacts and types of employees and non-employees in its own workforce that are positively affected or could be positively affected	Pages 82-83, 88			
S1	SBM-3	14d		Description of material risks and opportunities arising from impacts and dependencies on own workforce	Pages 83, 134			
S1	SBM-3	14e		Description of material impacts on workers that may arise from transition plans for reducing negative impacts on environment and achieving greener and climate-neutral operations	Page 38 Partially reported			
S1	SBM-3	14f (i)		Information about type of operations at significant risk of incidents of forced labour or compulsory labour	Page 88	GRI 409	409-1	Operations considered to have significant risk for incidents of forced or compulsory labor in terms of: type of operation (such as manufacturing plant)
S1	SBM-3	14f (ii)		Information about countries or geographic areas with operations considered at significant risk of incidents of forced labour or compulsory labour	Page 88	GRI 409	409-1	Operations considered to have significant risk for incidents of forced or compulsory labor in terms of: countries or geographic areas with operations considered at risk
S1	SBM-3	14g (i)		Information about type of operations at significant risk of incidents of child labour				
S1	SBM-3	14g (ii)		Information about countries or geographic areas with operations considered at significant risk of incidents of child labour				
S1	SBM-3	15	AR 8	Disclosure of how understanding of people in its own workforce / value chain workers with particular characteristics, working in particular contexts, or undertaking particular activities may be at greater risk of harm has been developed				
S1	SBM-3	16	AR 9	Disclosure of which of material risks and opportunities arising from impacts and dependencies on people in its own workforce relate to specific groups of people				
S1	S1-1	19		Policies to manage material impacts, risks and opportunities related to its own workforce	Pages 81, 83-84, 86, 88-90, 106, 127, 168			
S1	S1-1	19		Policies to manage material impacts, risks and opportunities related to own workforce, including for specific groups within workforce or all own workforce	Pages 106, 108 Page 108	GRI 2	2-23	Describe the organization's specific policy commitment to respect human rights, including: the categories of stakeholders, including at-risk or vulnerable groups, that the organization gives particular attention to in the commitment
S1	S1-1	20		Description of relevant human rights policy commitments relevant to own workforce	Pages 88-89	GRI 2	2-23	Describe the organization's specific policy commitment to respect human rights, including: the internationally recognized human rights that the commitment covers
S1	S1-1	20a		Disclosure of general approach in relation to respect for human rights including labour rights, of people in its own workforce	Pages 88-89			
S1	S1-1	20b		Disclosure of general approach in relation to engagement with people in its own workforce	Pages 16, 86-87	GRI 2	2-29	Describe the organization's approach to engaging with stakeholders

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ESRS	DR	Paragraph	Related Application Requirement	Name	Location (shared and individual references)		GRI Standard	Disclosure	Name
S1	S1-1	20c		Disclosure of general approach in relation to measures to provide and (or) enable remedy for human rights impacts	Pages 88-90		GRI 2	2-25	Describe the organization's commitments to provide for or cooperate in the remediation of negative impacts that the organization identifies it has caused or contributed to
					Page 108		GRI 3	3-3	Actions to address actual negative impacts, including actions to provide for or cooperate in their remediation
S1	S1-1	21	AR 12	Disclosure of whether and how policies are aligned with relevant internationally recognised instruments	Page 88		GRI 2	2-23	The authoritative intergovernmental instruments that the commitments reference
S1	S1-1	22		Policies explicitly address trafficking in human beings, forced labour or compulsory labour and child labour	Page 88 and website		GRI 3	3-3	Describe the organization's policies or commitments regarding the material topic
					Not applicable		GRI 408	408-1	Measures taken by the organization in the reporting period intended to contribute to the effective abolition of child labor
					Not applicable		GRI 409	409-1	Measures taken by the organization in the reporting period intended to contribute to the elimination of all forms of forced or compulsory labor
S1	S1-1	23		Workplace accident prevention policy or management system is in place	Pages 91, 99		GRI 403	403-1	A statement of whether an occupational health and safety management system has been implemented
S1	S1-1	24a		Specific policies aimed at elimination of discrimination are in place	Page 106		GRI 3	3-3	Policies or commitments regarding the material topic
S1	S1-1	24b	AR 15 - AR 16	Grounds for discrimination are specifically covered in policy	Page 106				
S1	S1-1	24c		Disclosure of specific policy commitments related to inclusion and (or) positive action for people from groups at particular risk of vulnerability in own workforce	Page 106		GRI	2-23	Describe the organization's specific policy commitment to respect human rights, including: the categories of stakeholders, including at-risk or vulnerable groups, that the organization gives particular attention to in the commitment
S1	S1-1	24d		Disclosure of whether and how policies are implemented through specific procedures to ensure discrimination is prevented, mitigated and acted upon once detected, as well as to advance diversity and inclusion	Page 106		GRI 3	3-3	Describe actions taken to manage the topic and related impacts, including: actions to prevent or mitigate potential negative impacts; actions to address actual negative impacts, including actions to provide for or cooperate in their remediation; actions to manage actual and potential positive impacts
					Pages 101-102		GRI 404	404-2	Type and scope of programs implemented and assistance provided to upgrade employee skills
ESRS 2		62		Disclosures to be reported in case the undertaking has not adopted policies	Not applicable				
S1	S1-2	27	AR 21 AR 23-24	Disclosure of whether and how perspectives of own workforce inform decisions or activities aimed at managing actual and potential impacts	Pages 16, 90		GRI 3	3-3	Describe how engagement with stakeholders has informed the actions taken (3-3-d)
S1	S1-2	27a		Engagement occurs with own workforce or their representatives	Pages 86-87				
S1	S1-2	27b	AR 19	Disclosure of stage at which engagement occurs, type of engagement and frequency of engagement	Pages 16, 86-87				
S1	S1-2	27c	AR 18-19	Disclosure of function and most senior role within undertaking that has operational responsibility for ensuring that engagement happens and that results inform undertaking's approach	Page 84	Page 126	GRI 2	2-12	Describe whether and how the highest governance body engages with stakeholders to support these processes due diligence and other processes to identify and manage the organization's impacts

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ESRS	DR	Paragraph	Related Application Requirement	Name	Location (shared and individual references)	GRI Standard	Disclosure	Name
S1	S1-2	27d	AR 20	Disclosure of Global Framework Agreement or other agreements related to respect of human rights of workers	Pages 88, 127			
S1	S1-2	27e		Disclosure of how effectiveness of engagement with its own workforce is assessed	Pages 86, 89-90	GRI 2	2-29	Describe how the organization seeks to ensure meaningful engagement with stakeholders
S1	S1-2	28		Disclosure of steps taken to gain insight into perspectives of people in its own workforce that may be particularly vulnerable to impacts and (or) marginalised	Pages 86-87	GRI 2	2-29	Describe how the organization seeks to ensure meaningful engagement with stakeholders
S1	S1-2	29		Statement in case the undertaking has not adopted a general process to engage with its own workforce	Not applicable			
S1	S1-3	32a	AR 27	Disclosure of general approach to and processes for providing or contributing to remedy where undertaking has caused or contributed to a material negative impact on people in its own workforce	Pages 86, 89-90, 108	GRI 2	2-25	Describe the organization's approach to identify and address grievances, including the grievance mechanisms that the organization has established or participates in; describe other processes by which the organization provides for or cooperates in the remediation of negative impacts that it identifies it has caused or contributed to
S1	S1-3	32b	AR 28	Disclosure of specific channels in place for its own workforce to raise concerns or needs directly with undertaking and have them addressed	Pages 86, 89-90, 108	GRI 2	2-25	Describe the organization's approach to identify and address grievances, including the grievance mechanisms that the organization has established or participates in
					Pages 86-87	GRI 403	403-2	A description of the processes for workers to report work-related hazards and hazardous situations, and an explanation of how workers are protected against reprisals
S1	S1-3	32c		Grievance or complaints handling mechanisms related to employee matters exist	Page 89			
S1	S1-3	32d		Disclosure of processes through which undertaking supports or requires availability of channels	Page 89			
S1	S1-3	32e	AR 32	Disclosure of how issues raised and addressed are tracked and monitored and how effectiveness of channels is ensured	Pages 89-90	GRI 2	2-25	Describe how the stakeholders who are the intended users of the grievance mechanisms are involved in the design, review, operation, and improvement of these mechanisms; describe how the organization tracks the effectiveness of the grievance mechanisms and other remediation processes, and report examples of their effectiveness, including stakeholder feedback
					Pages 86, 89-90	GRI 2	2-26	Describe the mechanisms for individuals to: seek advice on implementing the organization's policies and practices for responsible business conduct
S1	S1-3	33	AR 31	Disclosure of whether and how it is assessed that its own workforce is aware of and trust structures or processes as way to raise their concerns or needs and have them addressed	Pages 86, 89-90	GRI 2	2-25	Describe how the organization tracks the effectiveness of the grievance mechanisms and other remediation processes, and report examples of their effectiveness, including stakeholder feedback
S1	S1-3	33		Policies regarding protection against retaliation for individuals that use channels to raise concerns or needs are in place	Page 89			
					Page 89	GRI 403	403-2	A description of the processes for workers to report work-related hazards and hazardous situations, and an explanation of how workers are protected against reprisals
S1	S1-3	34		Statement in case the undertaking has not adopted a channel for raising concerns	Not applicable			
S1	S1-4	37		Action plans and resources to manage its material impacts, risks, and opportunities related to its own workforce	Pages 81, 94-98, 101, 108			

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ESRS	DR	Paragraph	Related Application Requirement	Name	Location (shared and individual references)		GRI Standard	Disclosure	Name
S1	S1-4	38a	AR 42	Description of action taken, planned or underway to prevent or mitigate negative impacts on own workforce	Pages 31, 94, 98	Page 92	GRI 3	3-3	Actions to prevent or mitigate potential negative impacts
					Pages 31, 94, 98	Page 92	GRI 403	403-9	The work-related hazards that pose a risk of high-consequence injury, including actions taken or underway to eliminate these hazards and minimize risks using the hierarchy of controls. Any actions taken or underway to eliminate other work-related hazards and minimize risks using the hierarchy of controls
							GRI 403	403-10	The work-related hazards that pose a risk of ill health, including: actions taken or underway to eliminate these hazards and minimize risks using the hierarchy of controls
					Page 92				
S1	S1-4	38b		Disclosure on whether and how action has been taken to provide or enable remedy in relation to actual material impact	Pages 86, 89-90, 108		GRI 3	3-3	Actions to address actual negative impacts, including actions to provide for or cooperate in their remediation
S1	S1-4	38c	AR 42	Description of additional initiatives or actions with primary purpose of delivering positive impacts for own workforce	Pages 84, 88		GRI 3	3-3	Actions to manage actual and potential positive impacts
S1	S1-4	38d	AR 38-AR 39	Description of how effectiveness of actions and initiatives in delivering outcomes for own workforce is tracked and assessed	Pages 16, 95-99, 108, 126		GRI 3	3-3	Processes used to track the effectiveness of the actions
S1	S1-4	39	AR 34	Description of process through which it identifies what action is needed and appropriate in response to particular actual or potential negative impact on own workforce	Pages 16, 95-99, 108, 126		GRI 3	3-3	Describe how engagement with stakeholders has informed the actions taken (3-3-d)
S1	S1-4	40a	AR 44-45 AR 47	Description of what action is planned or underway to mitigate material risks arising from impacts and dependencies on own workforce and how effectiveness is tracked	Pages 16, 95-99, 108, 126				
S1	S1-4	40b		Description of what action is planned or underway to pursue material opportunities in relation to own workforce	Page 104				
S1	S1-4	41	AR 37	Disclosure of whether and how it is ensured that own practices do not cause or contribute to material negative impacts on own workforce	Pages 86, 89-90				
S1	S1-4	43		Disclosure of resources are allocated to the management of material impacts	Not reported				
					Pages 86, 89-90		GRI 3	3-3	Actions to prevent or mitigate potential negative impacts; actions to address actual negative impacts, including actions to provide for or cooperate in their remediation;
					Pages 86, 89-90		GRI 3	3-3	Actions to manage actual and potential positive impacts;
					Pages 22, 86, 89-90		GRI 3	3-3	The effectiveness of the actions, including progress toward the goals and targets
					Pages 86, 89-90		GRI 3	3-3	Lessons learned and how these have been incorporated into the organization's operational policies and procedures
					Pages 22, 103		GRI 2	2-24	How the organization implements its commitments with and through its business relationships; training that the organization provides on implementing the commitments
					Pages 13-20		GRI 3	3-3	Describe how engagement with stakeholders has informed the actions taken (3-3-d)
S1	S1-4	AR 43		Information about measures taken to mitigate negative impacts on workers that arise from transition to greener, climate-neutral economy	Page 38 Partially reported				

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ESRS	DR	Paragraph	Related Application Requirement	Name	Location (shared and individual references)		GRI Standard	Disclosure	Name
ESRS 2		62		Disclosures to be reported if the undertaking has not adopted actions	Not applicable				
S1	S1-5	46	AR 50-AR 52	Targets set to manage material impacts, risks and opportunities related to own workforce	Page 22				
S1	S1-5	47a		Disclosure of whether and how own workforce or workforce representatives were engaged directly in setting targets	Not reported				
S1	S1-5	47b		Disclosure of whether and how own workforce or workforce representatives were engaged directly in tracking performance against targets	Not reported	Pages 13-20	GRI 3	3-3	Describe how engagement with stakeholders has informed whether the actions have been effective (3-3-e)
S1	S1-5	47c		Disclosure of whether and how own workforce or workforce representatives were engaged directly in identifying lessons or improvements as result of undertakings performance	Pages 16, 89-90		GRI 3	3-3	Describe how engagement with stakeholders has informed whether the actions have been effective (3-3-e)
ESRS 2		81		Disclosures to be reported if the undertaking has not adopted targets	Not applicable				
S1	S1-6	50a		Characteristics of undertaking's employees – number of employees by gender table	Pages 82, 173	Pages 107, 173	GRI 2	2-7	Report the total number of employees, and a breakdown of this total by gender
					Pages 82, 173	Pages 107, 173	GRI 405	405-1	Percentage of employees per employee category in each of the following diversity categories: Gender
S1	S1-6	50a	AR 57	Number of employees (head count)	Page 107		GRI 2	2-7	Report the total number of employees, and a breakdown of this total by gender (at the end of the reporting period)
					Pages 82, 173		GRI 405	405-1	Percentage of employees per employee category in each of the following diversity categories: Gender
S1	S1-6	50a		Average number of employees (head count)	Page 82		GRI 2	2-7	Report the total number of employees, and a breakdown of this total by gender (as an average across the reporting period)
					Page 82	Pages 107, 173	GRI 405	405-1	Percentage of employees per employee category in each of the following diversity categories: Gender
S1	S1-6	50a		Characteristics of undertaking's employees – number of employees in countries with 50 or more employees table	Not reported	Page 107	GRI 2	2-7	Report the total number of employees, and a breakdown of this total by region
S1	S1-6	50a		Number of employees in countries with 50 or more employees	Not reported	Page 107	GRI 2	2-7	Report the total number of employees, and a breakdown of this total by region (at the end of the reporting period)
S1	S1-6	50a		Average number of employees in countries with 50 or more employees	Not reported	Page 107	GRI 2	2-7	Report the total number of employees, and a breakdown of this total by region (as an average across the reporting period)
S1	S1-6	50b		Characteristics of undertaking's employees – information on employees by contract type, gender and region table	Pages 82, 107	Page 107	GRI 2	2-7	Report the total number of permanent employees, temporary employees, non-guaranteed hours employees, and a breakdown by gender and by region
S1	S1-6	50b + 51		Number of employees (head count or full-time equivalent)	Pages 82, 107	Page 107	GRI 2	2-7	Report the total number of permanent employees, temporary employees, non-guaranteed hours employees, and a breakdown by gender and by region (at the end of the reporting period)
S1	S1-6	50b + 51		Average number of employees (head count or full-time equivalent)	Page 82	Page 107	GRI 2	2-7	Report the total number of permanent employees, temporary employees, non-guaranteed hours employees, and a breakdown by gender and by region (as an average across the reporting period)
S1	S1-6	50c	AR 59	Number of employee turnover	Page 82		GRI 401	401-1	Total number of employee turnover during the reporting period

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ESRS	DR	Paragraph	Related Application Requirement	Name	Location (shared and individual references)		GRI Standard	Disclosure	Name
S1	S1-6	50c		Percentage of employee turnover	Page 82	Information partially unavailable/incomplete (401-1 a.): Whilst we provide data on employee numbers and rate year-on-year, we do not report new employee hires by age group, due to data availability across the regions where we operate in various contractual arrangements many of which rely on professional agencies. Information partially unavailable/incomplete (401-1 b.): We provide data on employee numbers but only percentage data on turnover, and only by region	GRI 401	401-1	Rate of employee turnover during the reporting period
S1	S1-6	50d	AR 60	Description of methodologies and assumptions used to compile data (employees)	Page 82		GRI 2	2-7	Describe the methodologies and assumptions used to compile the data
S1	S1-6	50d (i)		Employees numbers are reported in head count or full-time equivalent	Page 82		GRI 2	2-7	Describe whether the numbers are reported in head count, full-time equivalent (FTE), or using another methodology
S1	S1-6	50d (ii)		Employees numbers are reported at end of reporting period/average/other methodology	Page 82		GRI 2	2-7	Describe whether the numbers are reported at the end of the reporting period, as an average across the reporting period, or using another methodology
S1	S1-6	50e	AR 58	Disclosure of contextual information necessary to understand data (employees)	Page 82	No significant fluctuations in headcount. Information unavailable/incomplete (GRI 2-7b.iii): Vesuvius does not employ non-guaranteed hours employees	GRI 2	2-7	Report contextual information necessary to understand the data reported under 2-7-a and 2-7-b; describe significant fluctuations in the number of employees during the reporting period and between reporting periods
S1	S1-6	50f		Disclosure of cross-reference of information reported under paragraph 50 (a) to most representative number in financial statements	Not reported				
					Page 107		GRI 2	2-7	Report the total number of part-time employees, and a breakdown by gender and by region
S1	S1-7	55a	AR 61	Number of non-employees in own workforce	Page 82		GRI 2	2-8	Report the total number of workers who are not employees and whose work is controlled by the organization
S1	S1-7	55a		Number of non-employees in own workforce – self-employed people	Not reported	Page 82	GRI 2	2-8	Report the total number of workers who are not employees and whose work is controlled by the organization
S1	S1-7	55a		Number of non-employees in own workforce – people provided by undertakings primarily engaged in employment activities	Not reported				
					Page 82		GRI 2	2-8	Describe the most common types of worker and their contractual relationship with the organization; the type of work they perform
S1	S1-7	55b		Description of methodologies and assumptions used to compile data (non-employees)	Page 82		GRI 2	2-8	Describe the methodologies and assumptions used to compile the data

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ESRS	DR	Paragraph	Related Application Requirement	Name	Location (shared and individual references)	GRI Standard	Disclosure	Name
S1	S1-7	55b (i)		Non-employees numbers are reported in head count/ full time equivalent	Page 82	GRI 2	2-8	Describe whether the number of workers who are not employees is reported in head count, full-time equivalent (FTE), or using another methodology
S1	S1-7	55b (ii)		Non-employees numbers are reported at end of reporting period/average/other methodology	Page 82	GRI 2	2-8	Describe whether the number of workers who are not employees is reported at the end of the reporting period, as an average across the reporting period, or using another methodology
S1	S1-7	55c	AR 64-AR 65	Disclosure of contextual information necessary to understand data (non-employee workers)	Page 82	GRI 2	2-8	Describe significant fluctuations in the number of workers who are not employees during the reporting period and between reporting periods
S1	S1-7	57	AR 63	Description of basis of preparation of non-employees estimated number	Page 82			
S1	S1-8	60a	AR 66	Percentage of total employees covered by collective bargaining agreements	Page 90	GRI 2	2-30	Report the percentage of total employees covered by collective bargaining agreements
S1	S1-8	60b		Percentage of its employees covered by collective bargaining agreements are within coverage rate by country (in the EEA)	Not reported			
S1	S1-8	60c		Percentage of own employees covered by collective bargaining agreements (outside EEA) by region	Not reported Page 90	GRI 2	2-30	For employees not covered by collective bargaining agreements, report whether the organization determines their working conditions and terms of employment based on collective bargaining agreements that cover its other employees or based on collective bargaining agreements from other organizations
S1	S1-8	63a	AR 69	Percentage of employees in country (EEA) covered by workers' representatives	Not reported			
S1	S1-8	63b		Disclosure of existence of any agreement with employees for representation by European Works Council (EWC), Societas Europaea (SE) Works Council, or Societas Cooperativa Europaea (SCE) Works Council	Page 90			
S1	S1-8	AR 70		Own workforce in region (non-EEA) covered by collective bargaining agreements by coverage rate and by region	Not reported			
S1	S1-9	66a		Number of employees (head count) at top management level	Page 107 Pages 107, 173	GRI 405	405-1	Percentage of individuals within the organization's governance bodies in each of the following diversity categories: Gender. Percentage of employees per employee category in each of the following diversity categories: Gender
S1	S1-9	66a		Percentage of employees at top management level	Page 173			

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ESRS	DR	Paragraph	Related Application Requirement	Name	Location (shared and individual references)		GRI Standard	Disclosure	Name
S1	S1-9	66b		Percentage of employees (head count): under 30 years old, between 30 and 50 years old, over 50 years old (numbers not reported, we use percentages)	Page 172	Page 173 Information unavailable (405-1 a. ii. & b. ii. governance body/employee category broken down by age groups): we do not report this data. Such a breakdown is not a meaningful indicator of impact, risk or opportunity in a governance body; also, the varied extent of jurisdictional legislation around the world prevents access to certain employees' personal information: a percentage would not be meaningful or useful	GRI 405	405-1	Percentage of employees per employee category in each of the following diversity categories: Age group: under 30 years old, between 30 and 50, over 50
S1	S1-9	AR 71		Disclosure of own definition of top management used	Page 106				
S1	S1-10	69	AR 72–AR 74	All employees are paid adequate wage, in line with applicable benchmarks	Pages 104, 108				
S1	S1-10	70		Adequate wages by country table	Not reported				
S1	S1-10	70		Percentage of employees paid below the applicable adequate wage benchmark	Not reported				
S1	S1-11	74a + 74c + 74d + 74e		All employees in own workforce are covered by social protection, through public programs or through benefits offered, against loss of income due to sickness	Pages 88, 98, 108	Information partially unavailable/incomplete (401-2 a. i, iii, v, or vi): we do not collect data on certain benefits listed in the Standard. Information unavailable/incomplete (401-2 b. on the definition used for 'significant locations of operation'): the working conditions listed in our report apply across all sites, there is no data to indicate that certain sites are excluded. Note: full-time and part-time permanent employees enjoy the same benefits at Vesuvius; temporary employee benefits are governed by the relevant agencies' employment contracts	GRI 401	401-2	Benefits which are standard for full-time employees of the organization but are not provided to temporary or part-time employees, by significant locations of operation. These include, as a minimum: health care, disability and invalidity coverage, parental leave, retirement provision. The definition used for 'significant locations of operation'
S1	S1-11	74b		All employees in own workforce are covered by social protection, through public programs or through benefits offered, against loss of income due to unemployment starting from when own worker is working for undertaking	Not reported				

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ESRS	DR	Paragraph	Related Application Requirement	Name	Location (shared and individual references)	GRI Standard	Disclosure	Name
S1	S1-11	75	AR 75	Social protection employees by country table by types of events and type of employees including non employees	Information partially unavailable/incomplete See note for DR S1-11 74a	GRI 401	401-2	Benefits which are standard for full-time employees of the organization but are not provided to temporary or part-time employees, by significant locations of operation. These include, as a minimum: health care; disability and invalidity coverage; parental leave; retirement provision. The definition used for 'significant locations of operation'
S1	S1-11	75		Disclosure of types of employees who are not covered by social protection, through public programs or through benefits offered, against loss of income due to sickness	Information partially unavailable/incomplete See note for DR S1-11 74a	GRI 401	401-2	Benefits which are standard for full-time employees of the organization but are not provided to temporary or part-time employees, by significant locations of operation. These include, as a minimum: health care. The definition used for 'significant locations of operation'
S1	S1-11	75		Disclosure of types of employees who are not covered by social protection, through public programs or through benefits offered, against loss of income due to unemployment starting from when own worker is working for undertaking	Not reported			
S1	S1-11	75		Disclosure of types of employees who are not covered by social protection, through public programs or through benefits offered, against loss of income due to employment injury and acquired disability	Information partially unavailable/incomplete See note for DR S1-11 74a	GRI 401	401-2	Benefits which are standard for full-time employees of the organization but are not provided to temporary or part-time employees, by significant locations of operation. These include, as a minimum: disability and invalidity coverage. The definition used for 'significant locations of operation'
S1	S1-11	75		Disclosure of types of employees who are not covered by social protection, through public programs or through benefits offered, against loss of income due to maternity leave	Information partially unavailable/incomplete See note for DR S1-11 74a	GRI 401	401-2	Benefits which are standard for full-time employees of the organization but are not provided to temporary or part-time employees, by significant locations of operation. These include, as a minimum: parental leave. The definition used for 'significant locations of operation'
S1	S1-11	75		Disclosure of types of employees who are not covered by social protection, through public programs or through benefits offered, against loss of income due to retirement	Information partially unavailable/incomplete See note for DR S1-11 74a	GRI 401	401-2	Benefits which are standard for full-time employees of the organization but are not provided to temporary or part-time employees, by significant locations of operation. These include, as a minimum: retirement provision. The definition used for 'significant locations of operation'
S1	S1-12	79		Percentage of persons with disabilities amongst employees subject to legal restrictions on collection of data	Page 108 (#, not percentage)	GRI 405	405-1	Percentage of employees per employee category in each of the following diversity categories: Other indicators of diversity where relevant (such as minority or vulnerable groups)
S1	S1-12	80		Percentage of employees with disabilities in own workforce breakdown by gender table	Not reported			
S1	S1-12	AR 76		Disclosure of contextual information necessary to understand data and how data has been compiled (persons with disabilities)	Pages 81-83, 106, 108			
S1	S1-13	83a	AR 77	Training and skills development indicators gender table	Not reported in a table	GRI 404	404-3	Percentage of total employees by gender who received a regular performance and career development review during the reporting period
S1	S1-13	83a	AR 77	Percentage of employees that participated in regular performance and career development reviews	Page 104	GRI 404	404-3	Percentage of total employees by gender who received a regular performance and career development review during the reporting period
S1	S1-13	83b	AR 78	Average number of training hours by gender table	Not reported in a table	GRI 404	404-1	Average hours of training that the organization's employees have undertaken during the reporting period, by: gender

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ESRS	DR	Paragraph	Related Application Requirement	Name	Location (shared and individual references)	GRI Standard	Disclosure	Name
S1	S1-13	83b	AR 78	Average number of training hours per person for employees	Page 104 Information unavailable/incomplete (404-1 a. average hours by gender and employee category): the flexible and complex structure of employment at Vesuvius prevents any average of hours becoming a meaningful indicator of performance in terms of technical, personal and career advancement. On-the-job training is not quantifiable but it takes place throughout the organisation for essential knowledge transfer	GRI 404	404-1	Average hours of training that the organization's employees have undertaken during the reporting period, by: gender and employee category
					Page 104 partially reported – not all category data provided	GRI 404	404-3	Percentage of total employees by employee category who received a regular performance and career development review during the reporting period
S1	S1-14	88a	AR 80	Percentage of people in its own workforce who are covered by health and safety management system based on legal requirements and (or) recognised standards or guidelines	Pages 91, 99 Page 91 100% covered: Our safety management system covers all personnel, whether they are employees, contractors (directly supervised or not) and visitors Page 99	GRI 403	403-8	If the organization has implemented an occupational health and safety management system based on legal requirements and/or recognized standards/guidelines: the percentage of all employees and workers who are not employees but whose work and/or workplace is controlled by the organization, who are covered by such a system
S1	S1-14	88b	AR 89-91	Number of fatalities in own workforce as result of work-related injuries and work-related ill health	Pages 99, 170-71 Pages 99, 170-71	GRI 403	403-9	For all employees: The number of fatalities as a result of work-related injury; For all workers who are not employees but whose work and/or workplace is controlled by the organization: The number of fatalities as a result of work-related injury
						GRI 403	403-10	For all employees: The number of fatalities as a result of work-related ill health; For all workers who are not employees but whose work and/or workplace is controlled by the organization: The number of fatalities as a result of work-related ill health
S1	S1-14	88b	AR 89-91	Number of fatalities as result of work-related injuries and work-related ill health of other workers working on undertaking's sites	Pages 99, 170-71 Pages 99, 170-71	GRI 403	403-9	For all workers who are not employees but whose work and/or workplace is controlled by the organization: The number of fatalities as a result of work-related injury
						GRI 403	403-10	For all workers who are not employees but whose work and/or workplace is controlled by the organization: The number of fatalities as a result of work-related ill health
S1	S1-14	88c		Number of recordable work-related accidents for own workforce	Pages 99, 170-71	GRI 403	403-9	For all employees: The number of recordable work-related injuries; For all workers who are not employees but whose work and/or workplace is controlled by the organization: The number of recordable work-related injuries
S1	S1-14	88d		Number of cases of recordable work-related ill health of employees	No employees or other workers were reported to be affected by recordable incidents or fatalities from work-related ill health	GRI 403	403-10	For all employees: The number of cases of recordable work-related ill health

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ESRS	DR	Paragraph	Related Application Requirement	Name	Location (shared and individual references)		GRI Standard	Disclosure	Name
S1	S1-14	88e	AR 89-91 AR 95	Number of days lost to work-related injuries and fatalities from work-related accidents, work-related ill health and fatalities from ill health related to employees	Pages 99, 170-71				
S1	S1-15	93a	AR 96- AR 97	Percentage of employees entitled to take family-related leave	Not reported	Not applicable (not relevant)	GRI 401	401-3	Total number of employees that were entitled to parental leave
S1	S1-15	93b		Percentage of entitled employees that took family-related leave	Not reported	Not applicable (not relevant)	GRI 401	401-3	Total number of employees that took parental leave
S1	S1-15	93b		Percentage of entitled employees that took family-related leave by gender table	Not reported	Not applicable (not relevant)	GRI 401	401-3	Total number of employees that took parental leave, by gender
S1	S1-15	94		All employees are entitled to family-related leaves through social policy and (or) collective bargaining agreements	Not reported				
S1	S1-16	97a	AR 98- AR 99- AR 100	Gender pay gap table	Not reported	Annual Report pages 125-126 Information unavailable (405-2 a. ratio by gender): we do not report this data. Such a breakdown is not a meaningful indicator of impact, risk or opportunity at Vesuvius	GRI 405	405-2	Ratio of the basic salary and remuneration of women to men for each employee category, by significant locations of operation. The definition used for 'significant locations of operation'
S1	S1-16	97a	AR 98- AR 99- AR 100	Gender pay gap	Not reported	Annual Report pages 125-126 See note above	GRI 405	405-2	Ratio of the basic salary and remuneration of women to men for each employee category, by significant locations of operation. The definition used for 'significant locations of operation'
S1	S1-16	97b	AR 101	Annual total remuneration ratio	Annual Report pages 125-126		GRI 2	2-21	Report the ratio of the annual total compensation for the organization's highest-paid individual to the median annual total compensation for all employees (excluding the highest-paid individual)
S1	S1-16	97c	AR 102	Disclosure of contextual information necessary to understand data, how data has been compiled and other changes to underlying data that are to be considered	Annual Report pages 125-126		GRI 2	2-21	Report contextual information necessary to understand the data and how the data has been compiled
						Annual Report pages 125-126 See note S1-16 97a	GRI 405	405-2	Ratio of the basic salary and remuneration of women to men for each employee category, by significant locations of operation. The definition used for 'significant locations of operation'
						Annual Report pages 125-126 See note S1-16 97a	GRI 405	405-2	Ratio of the basic salary and remuneration of women to men for each employee category, by significant locations of operation. The definition used for 'significant locations of operation'
S1	S1-17	103a	AR 103- AR 106	Number of incidents of discrimination	Pages 88 and 90 Partially reported	Page 88	GRI 406	406-1	Total number of incidents of discrimination during the reporting period
S1	S1-17	103b	AR 103- AR 106	Number of complaints filed through channels for people in own workforce to raise concerns	Page 90 Partially reported				
S1	S1-17	103b	AR 103- AR 106	Number of complaints filed to National Contact Points for OECD Multinational Enterprises	Not reported				
S1	S1-17	103c	AR 103- AR 106	Amount of material fines, penalties, and compensation for damages as result of violations regarding social and human rights factors	Page 88		GRI 2	2-27	Report the total number and the monetary value of fines for instances of non-compliance with laws and regulations that were paid during the reporting period

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ESRS	DR	Paragraph	Related Application Requirement	Name	Location (shared and individual references)	GRI Standard	Disclosure	Name
S1	S1-17	103c	AR 103-AR 106	Information about reconciliation of material fines, penalties, and compensation for damages as result of violations regarding social and human rights factors with most relevant amount presented in financial statements	Not reported			
S1	S1-17	103d	AR 103-AR 106	Disclosure of contextual information necessary to understand data and how data has been compiled (work-related grievances, incidents and complaints related to social and human rights matters)	Pages 82, 88	GRI 2	2-27	Describe the significant instances of non-compliance; describe how the organization has determined significant instances of non-compliance
S1	S1-17	104a	AR 105	Number of severe human rights issues and incidents connected to own workforce	Page 88	GRI 3	3-3	Describe the actual and potential, negative and positive impacts on the economy, environment, and people, including impacts on their human rights; report whether the organization is involved with the negative impacts through its activities or as a result of its business relationships, and describe the activities or business relationships
S1	S1-17	104a	AR 105	Number of severe human rights issues and incidents connected to own workforce that are cases of non respect of UN Guiding Principles and OECD Guidelines for Multinational Enterprises	Page 88			
S1	S1-17	104a	AR 105	No severe human rights issues and incidents connected to own workforce have occurred	Page 88			
S1	S1-17	104b	AR 103-AR 106	Amount of material fines, penalties, and compensation for severe human rights issues and incidents connected to own workforce	Page 88	GRI 2	2-27	Report the total number and the monetary value of fines for instances of non-compliance with laws and regulations that were paid during the reporting period
S1	S1-17	104b	AR 103-AR 106	Information about reconciliation of amount of material fines, penalties, and compensation for severe human rights issues and incidents connected to own workforce with most relevant amount presented in financial statements	Page 88			
					Not applicable	GRI 406	406-1	Status of the incidents and actions taken with reference to the following: Incident reviewed by the organization; Remediation plans being implemented; Remediation plans that have been implemented, with results reviewed through routine internal management review processes; Incident no longer subject to action

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The imagery included in this Sustainability Report aims to capture the many different aspects of Vesuvius and our team around the world. The photographer Samuel Dhote shot most of these images.

www.samueldhote.com

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