

Sustainability

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

Background

Vesuvius remains committed to reducing its environmental impact by reducing, reusing and recycling waste and improving energy efficiency wherever economically viable. The Board recognises that good environmental management is aligned with the focus on cost optimisation and operational excellence.

The Group has 69 manufacturing sites, 18 warehouses and 91 sales offices located in 34 countries throughout the world's major economic regions. As part of our business model we locate facilities close to our customers to allow us to operate in just-in-time supply chains. This benefits the customer with short lead times from order to delivery and reduces the environmental impact of our logistics.

Vesuvius and its processes

Our manufacturing processes are not energy intensive (total energy costs are less than 3% of revenue, with only 1.9% of the total energy requirements across the Group consumed in the UK) and do not produce large quantities of hazardous or other wastes and emissions.

Our customers and their processes

As our products are used with molten metal at extreme temperatures, our primary commitment to our customers is the provision of reliable solutions to help protect their employees.

However, under the Vesuvius and Foseco brands, our business delivers a large range of solutions that help our customers improve not only the safety, but also the productivity of their operations, the quality of their products and the environmental footprint of their processes.

Thermal optimisation, slag and reject reduction are key factors in the processes for which we supply solutions. Vesuvius contributes to the reduction of its customers' energy usage and subsequent carbon dioxide ("CO₂") emissions through insulating materials, laminar flow management, facilitating extended manufacturing sequences and reduced downtime. A number of case studies, showing the effect and importance of the Group's products on customers's greenhouse gas ("GHG") and CO₂ savings, are shown later in this section.

Environmental Monitoring

All our factory emissions are proactively managed in accordance with local regulations. Regular analysis of our operations enables us to take appropriate actions to reduce our emissions and operate more efficiently. As you will see from its inclusion as a key performance indicator for the Group (page 17), we consider our levels of energy use as a fundamental indicator in the day-to-day performance of our business. Consequently, the Group monitors its energy consumption, worldwide CO₂ emissions and usage of water.

Regulatory Commitments

The Group also meets all of its obligations in relation to the Carbon Reduction Commitment Energy Efficiency Scheme ("CRC") and the Producer Responsibility Packaging Waste regulations.

The CRC is a mandatory scheme designed to encourage large public and private sector organisations to reduce their carbon dioxide emissions through energy efficiency. The Group also has a Climate Change Agreement ("CCA") in place through the British Ceramic Confederation. This CCA commits us to achieving a specific level of energy consumption, which reduces the CCA levy payable if we are successful.

The Packaging Waste regulations require us to report the total volume of waste packaging we handle each year and to pay a contribution towards the collection and recycling costs of this material by purchasing Packaging Waste Recovery Notes ("PRN").

Energy Conservation Plan

The Vesuvius Energy Conservation Plan was launched in 2011 with the objective of reducing our normalised energy consumption by 10% over the following three years. Whilst we have made progress, we are still working towards achieving this target. Managing our energy intensity is part of enhancing our cost competitiveness. It also contributes to improving the total environmental impact of our customers. It is part of our commitment to the communities in which we operate.

Greenhouse Gas Reporting

In reporting GHG emissions, we have used the GHG Protocol Corporate Accounting and Reporting Standard (revised edition) methodology to identify our greenhouse gas inventory of Scope 1 (direct) and Scope 2 (indirect) CO₂. We report in CO₂ equivalent ("CO₂e").

**Global GHG emissions data for period 1
January 2013 to 31 December 2013**

	kg of CO ₂ e Current Reporting Year 2013
Emissions from:	
Combustion of fuel & operation of facilities	398,250
Electricity, heat, steam and cooling purchased for own use	101,216
Vesuvius' chosen intensity measurement: Emissions reported above normalised to per tonne of product output	520

METHODOLOGY

We have reported to the extent reasonably practicable on all the emission sources required under the Act which fall within our consolidated financial statements.

Scope 1 covers emissions from fuels used in our factories and offices. Scope 2 relates to the indirect emissions resulting from the generation of electricity, heat, steam and hot water we purchase to supply our offices and factories.

We have used data gathered to fulfil our requirements under the CRC Energy Efficiency scheme and emission factors from UK Government's GHG Conversion Factors for Company Reporting 2014 in the calculation of our GHG.

So what is Vesuvius?
A Responsible Supplier

1.8 tonnes of CO₂ are emitted for every tonne of steel produced. In 2010 the iron and steel industry accounted for approximately 6.7% of total world CO₂ emissions. Additionally, approximately 10 kg of refractory material is required per tonne of steel produced.

Vesuvius' products, which include refractories, reduce the energy consumption of our customers and, as their usage also increases the quality of customers' products and reduces waste, they are increasingly beneficial when energy costs rise. Benefits are realised through:

- Working closely with customers to improve processes through the supply of technologically advanced consumables to reduce energy intensity and CO₂e Intensity Ratio in our customers' processes
- Reductions in refractory usage per tonne of steel produced by customers, from higher quality longer service life
- An increase in the level of good castings produced per tonne of metal melted through improved mould design and the application of molten metal filtration and feeding systems
- Further downstream benefits of enabling lighter, thinner and stronger components leading to lighter vehicles and less energy consumption.

A Responsible Manufacturer

Vesuvius' products are manufactured using energy intensive processes. Energy management and the CO₂e Intensity Ratio reduction are actively recognised as an area of increasing importance.

Through our membership of the European Refractories Producers Federation, currently chaired by François Wanecq, Vesuvius' Chief Executive, we work closely with other manufacturers to reduce the industry carbon footprint. Most recently, a European footprinting exercise has been completed for refractories as part of the 2050 roadmap, with the ultimate ambition of an 80% reduction in the carbon footprint of the European ceramic industry.

Detailed analysis of energy usage and GHG emissions are undertaken to focus on significant processes, with a view to reducing the energy consumption and CO₂e Intensity Ratio.

A Responsible Purchaser

Fuel selection is made carefully to account for current and future cost trends, availability and environmental impact.

Vesuvius' purchasing professionals work closely with suppliers to ensure availability of raw materials and their sustainable supply.

Sourcing of new plant and equipment takes into account lifetime energy consumption in order to deliver a lower energy intensity, lower CO₂e intensity ratio and hence lower lifetime running cost.

Sustainability continued

Energy Efficiency and our Customers

Vesuvius' specialised expertise in molten metal handling and casting provides assistance to customers both by reducing the energy intensity of their existing and new breakthrough processes, and through the manufacture of new products that improve the energy efficiency of metal-using products in society.

We launched our Energy Efficiency and CO₂ Impact project to foster the deployment of energy efficiency and sustainable solutions engineered by our technology departments. A CO₂ Impact stamp, launched in 2011, highlights the most energy efficient solutions in our portfolio of products and services.

The following examples show a sample of the significant potential reduction in CO₂:

Steel Flow Control

- To support a major Mexican customer's need to reduce energy consumption and improve quality, Vesuvius designed, developed and implemented a significant process change. This resulted in not only all of the customer's requirements being met but also the following additional benefits:
 - Reduced preheating and associated energy consumption
 - Reduced refractory consumption
 - An 8,173 tons per annum steel yield improvement
 - A reduction in annual CO₂ emissions of 15,500,000 kg
- Vesuvius was able to apply its expertise in a European Steel customer to deliver improved mould flow, increased productivity and extended tundish lifetime, resulting in:
 - Reduced refractory consumption
 - Reduced preheat energy consumption
 - A 2,500 MT steel per annum yield improvement
 - This is equivalent to a reduction of 4,750,000 kg CO₂ emissions per annum.

Advanced Refractories

- In South Africa, Vesuvius is the leading supplier of calcined dolomite for use in the local primary steel industry.
- The manufacturing process emits significant quantities of CO₂ and has been the focus of a detailed study aimed at reducing the CO₂ intensity ratio and the energy intensity.
- In 2014 the process will be upgraded with an expected reduction in the energy intensity of 5%, resulting in:
 - A reduced combustion of coal of 2,400 MT per annum.
 - An equivalent reduction in emissions of 5,600,000 kg CO₂ per annum.



Foundry



- The Furnace Deck and Metal Transfer area accounts for over half of a foundry's energy consumption. Vesuvius' Foundry division offers solutions for these key areas that:
 - Improved yield through the use of SEDEX® STELEX® and STELEX Pro® molten metal filtration products and KALMIN® KALMINEX® and KALPUR® feeding systems.
 - An Italian ductile iron foundry achieved a reduction of 6,000,000 kg CO₂ annually for 57,000 tons castings shipped
 - There was an additional €180,000 saving in emission certificates
 - Reduced energy consumption, for example, through the use of KALTEK® refractory insulating linings for ladles.
 - One Dallas foundry achieved savings in CO₂ emissions of almost 1,200,000 kg CO₂
 - Resulted in right first time castings through computer simulation.

Foundry



- Foseco foundry ENERTEK crucibles are a new family of energy efficient crucibles. Specially designed to maximise thermal conductivity, they typically offer foundries a 3%–8% reduction in energy consumption with an equivalent reduction in CO₂ emissions.
- In just one aluminium sand foundry, this gave a reduction in CO₂ emissions of 33,000 kg per annum.

