Caring for the environment by reducing our Carbon Footprint

Reducing our Carbon Footprint

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AfriSam
Build with Confidence

Reducing our Carbon Footprint

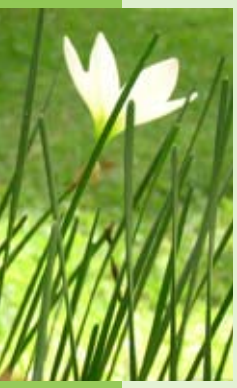
AfriSam - Leading the way in 'greener' manufacturing processes

The importance of environmental awareness and the realisation of the need to protect the earth and to conserve environmental resources is increasingly recognised worldwide. While debates have been raging the world over for decades on the over-consumption of resources, it is now a matter of urgency that all the citizens of the planet – individuals, organisations, industries and governments – do their bit to leave a good legacy for future generations.

Environmental stewardship for our planet and all its resources needs our attention if the world as we know it is to survive into the future.

What have we done so far

AfriSam has consistently led industry standards in environmental stewardship over many years. For over two decades AfriSam has been pioneering programmes and projects that improve on systems and processes to ensure the minimum possible impact of its operations on the environment.



Some of AfriSam's accomplishments over the years:

Year	Programme	Industry Status
1986	AfriSam initiated a "Conservation Trust" specifically designed to provide funding from current income streams to cover future mine closure costs. This was the company's first major recognition of sustainable development, with the objective of avoiding the transfer of environmental liability costs associated with today's consumption onto future generations.	First
1992	Establishment of an environmental department for continuing environmental performance improvement.	First
1994	First cement, aggregate and readymix concrete producer in South Africa to publish an environmental policy. The policy was the first to incorporate the principles of Sustainable Development and is revised annually.	First
1994/6	Only cement producer in South Africa to participate in TC207, the South African Technical Committee informing the ISO 14 001 development process.	First
2002	Introduction of annual Cement Kiln emission measuring and reporting (EMR) for metals, dioxins and furans. AfriSam is still the only South African and East African cement producer to measure up to 13 metals and dioxins, furans and polychlorinated biphenyls (PCBs) on an annual basis.	First

2002	First cement producer to introduce annual spot measurement (Discontinuous Emission Measurement or DEM) of up to 13 metals, dioxins, furans and polychlorinated biphenyls (PCBs) in its kiln emissions. All measurements are conducted using international best practice and under typical kiln operating conditions but in direct operational mode, the latter allowing for the identification of worst possible operational emissions.	First
2002 to 2008	AfriSam dominates the top awards and positions in the independently audited Aggregate and Sand Producers Association of South Africa (ASPASA) About Face Environmental Management Programme.	Leader
2002 to 2005	First cement producer in South Africa to install OPSIS (a world leader in continuous emission measuring) continuous emissions monitoring (CEM) in its kiln stacks. AfriSam is still the industry leader with the most comprehensive spectrum of emission measurement.	First
2003	First cement producer in South Africa to install bag filters on kiln stack emissions at our plant in Lichtenburg.	First
2005	AfriSam is a signatory to the Energy Efficiency Accord.	Leader
From 2006	AfriSam runs employee Environmental Awareness programmes across the group.	Leader
2008	AfriSam is the NBI Energy Efficiency Sector winner for its electrical energy savings.	First
2009	AfriSam commissions independent consultants to quantify the CO_2 footprint at all its 17 quarries and 40 readymix operations in South Africa.	First
2010	AfriSam meets stringent European Community emission limits for cement kilns utilising alternative fuels, namely EC Standard 76/2000/EC. By 2010 AfriSam was the only southern African Cement producer meeting these emission limits.	Leader
2010	AfriSam introduces its cement CO_2 rating system that indicates the actual calculated CO_2 generated per ton of that particular brand of AfriSam cement on the cement bag.	First

Background to Greenhouse Gas (GHG) emissions

Greenhouse Gases include amongst others CO_2, methane and nitrous oxide. Emissions from anthropogenic climate change have been steadily increasing since the industrial revolution in 1760 as the world's population and subsequent 'thirst' for fossil-fuels increase.

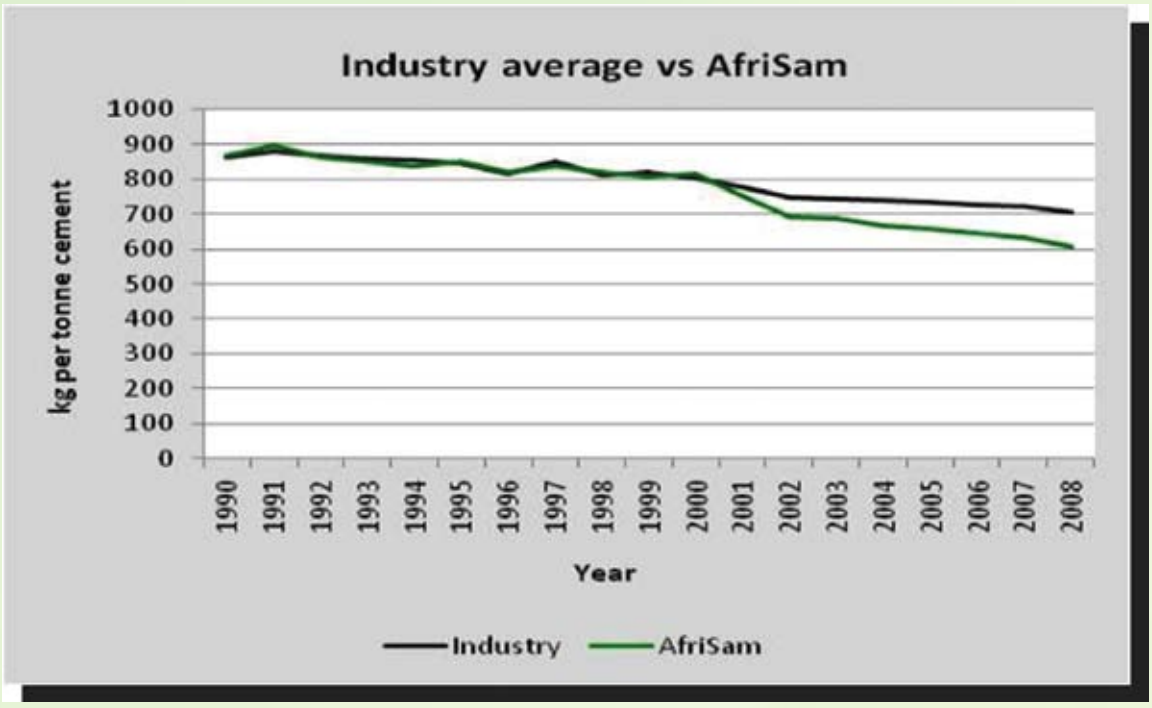
According to the standards measuring station at Mauna Loa Hawaii, the current atmospheric concentration of CO_2 is 390 ppm1 (parts per million) and increasing at three to four ppm per annum. Currently the world is producing around 42 gigatons of CO_2 per annum. Continuing at the current rate of production on the path of 'business as usual', it is postulated that there will be significant climate impacts in the form of rising global temperatures, rising sea levels and associated lowland

flooding. Collectively these will result in severe consequences for our existing environment. Added to the increasing human numbers - currently 6.6 billion but rising to an estimated 9.5 billion by 2050 - one of the factors contributing to rising CO_2 levels is the concurrent deforestation occurring in our equatorial and tropical forests worldwide. It is estimated that over the past 50 years forest cover has decreased by approximately 11 million square kilometres. The need for collective action is obviously urgent.

Paving the way for 'greener' Cement, Aggregates and Readymix Cement

Due to the cement industry's association with CO_2, the company's environmental efforts have been focused mainly on the management and reduction of this greenhouse gas from the company's processes.

Accurate annual technical reporting has further enabled AfriSam to calculate both its total (gross) and specific (CO_2 per ton of cementitious product) emissions since 1990. This measurement, coupled with the company's benchmarking programmes, has enabled management to set ambitious CO_2 reduction targets for emissions associated with AfriSam products.



These significant and industry leading reductions have been made possible by the reduction of clinker content of cement, increased fuel efficiencies resulting from improved kiln firing, heat recovery, and more efficient mining equipment, through to capital investments in electrically efficient equipment that has improved the company's electrical consumption by a dramatic 37% between 2000 and 2008.

In 2000, AfriSam implemented "Project Green Cement", an in-house project further developing and promoting the use of blended cements in South Africa. Through the selective use and blending

of mineral components such as AfriSam Slagment, fly ash and limestone, AfriSam has been able to continuously reduce the clinker factor in the cement without compromising cement quality. All AfriSam cements conform to prescribed SABS standards whilst having the added advantage of being low in CO_2, being less susceptible to the ingress of harmful substances as well as having improved durability and workability without sacrificing any of the strength and quality of traditional cements.

"Project Green Cement" has enabled AfriSam to reduce the clinker content in its cements whilst at the same time reducing by-products from other industries being disposed of, unproductively, at waste sites around the country. Apart from reducing the clinker content of the cements significantly and utilising far less non-renewable resources, an added advantage is increased cement production capacity utilising existing plant.

Continuing on AfriSam's path of industry innovation in late 2009, the company introduced another **first - this time a worldwide first** - with its cement CO_2 rating system that indicates the actual calculated CO_2 generated per ton of that particular brand of AfriSam cement on the cement bag. This industry first enables concerned consumers to make informed and responsible decisions on the cement products they purchase.

Aggregate and Readymix

Following the success of the CO_2 reduction programmes in its cement division, AfriSam commissioned independent consultants to quantify the CO_2 footprint at all its 17 quarries and 40 readymix operations in South Africa. Once again this initiative is believed to be a world first in the aggregate and readymix industry.

The CO_2 footprint report, which is generated and updated each year, will enable AfriSam to introduce management indicators in these sectors that will enable local management to measure and manage down their associated CO_2 generation. The programme is currently being extended to include AfriSam's Head Office and regional offices.

The road ahead

By 2010 the quantification and reporting of greenhouse gas emissions by industry was not a legal requirement in South Africa. However, AfriSam had already initiated a quantification and reporting programme to enable both the management and disclosure of its related emissions to interested consumers and the public as well as to facilitate the development of a comprehensive Greenhouse Gas Strategy for the company.

AfriSam recognises and commits to the collective responsibilities of all South Africans in reducing resource consumption and unnecessary emissions. To this end the company encourages all other construction material producers to utilise the same methodology to launch emission reduction programmes in their organisations.

Employee training and stakeholder engagement

In recognition of the role of all stakeholders in taking care of the environment, AfriSam has introduced a stakeholder engagement programme, encouraging amongst others, employees, suppliers, customers and the media to take ownership of environmental responsibility through action in areas that they have control over. Other platforms through which AfriSam is engaging stakeholders include award programmes in partnership with the South African Institute of Architects (SAIA) and Construction World magazine, where excellence in sustainable architecture and construction is rewarded, respectively.

Into the future

AfriSam has a dedicated environmental department which deals solely with issues in and around its operations which affect the environment. Going into the future, the company continues to look for ways to improve its systems and processes, to surpass its environmental achievements to date. With the increasing environmental awareness of its customers, AfriSam not only offers quality products but customer peace of mind through its commitment to sound environmental stewardship.

Greenhouse Gas Calculation Methodology

What the Greenhouse Gas (GHG) inventory entails

The inventory for AfriSam's aggregate and readymix operations is based on the GHG protocol, which is the most widely used international accounting tool for government and business leaders to understand, quantify, and manage greenhouse gas emissions. The preferred standard for a reporting window of CO_2 emissions is one calendar year, i.e. from January to December. This means that "per product" emissions are recommended to be updated annually.

The emission factors applied in this study were derived from the International Panel on Climate Change (IPCC), country specific factors and other published emission factors.

A specialist climate change consulting firm, InEnergy, ensures that all emission factors are accurate, representative and up-to-date in order to provide auditable results. The approximate measurement of emissions intensity was based on kg of CO_2 emitted per ton of product produced for cement as well as aggregate and per cubic meter of readymix.

Sources of Green House Gases

Most of the emissions resulting from the manufacture of AfriSam's products are a result of electricity and fossil fuel consumption. This is with the exception of cement, where approximately 50% of the CO_2 produced are process emissions, resulting from the decomposition of limestone.

As required by the GHG protocol, an 'operational control boundary' was implemented during the emission quantification process. This includes AfriSam and any of its subsidiaries for whom it controls any operating policies.

The boundary was further defined by 'cradle to gate', which takes into consideration the entire manufacturing process from when AfriSam acquires the raw product (cradle) to when the product reaches AfriSam's physical production gate (gate). Emissions incurred during delivery are not included in the boundary as these are often not within control of the manufacturer.

Mapping and measuring emission sources

Emission sources measured in AfriSam's aggregate and readymix operations incorporate onsite direct emissions, electricity indirect emissions and other offsite indirect emissions.

Direct emissions, also called 'Scope one GHG emissions' result from onsite fuel or process emissions. Sources measured in this area include:

- **Calcination/pyro-processing**
- **Fuel burning in pyro-processing**
- **On-site fuels:** Include diesel oil, gasoline (petrol) and liquefied petroleum gas (LPG).
  The main source of these emissions is onsite vehicles such as front-end loaders, haul trucks, etc.
- **Explosives:** These are used to fragment the limestone rock deposits.
- **Land use:** The alteration of land from its natural state to a disturbed state impacts negatively on the ability of the vegetation to absorb CO_2 from the atmosphere.

Indirect emissions, also known as 'Scope two GHG emissions' result mainly from the generation of imported electricity, heat and steam. This category includes emissions of suppliers that emit scope 1 emissions in providing their product to AfriSam. These include:

- **Municipal sewerage emissions:** Although CO_2 emissions from waste water are considered "carbon neutral", CH4 (methane) produced is accounted for.
- **Municipal water consumption**
- **Grid electricity consumption**

The definition of **Scope three or other Indirect GHG Emissions** depend on internal reporting standards and CDP requirements. Organisational activities resulting in other indirect emissions include: staff commuting, final production transportation by a third party and outsourced activities. All of these sources count towards an activity's greenhouse gas emissions inventory, but are not required to be reported.

AfriSam's methodology continues on back page...

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AfriSam's methodology

AfriSam's CO_2 calculation methodology is regularly reviewed and complies with the World Business Council for Sustainable Development's (WBCSD) Cement Sector Initiative (CSI) CO_2 methodology in the determination of scope 1 emissions and goes a step further to determine and report significant scope 2 and scope 3 emissions.