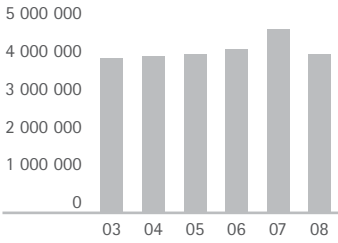
Environmental performance

This section deals with current operations and excludes waste arising from land remediation activities. Data relate to the Group's main operations in South Africa.

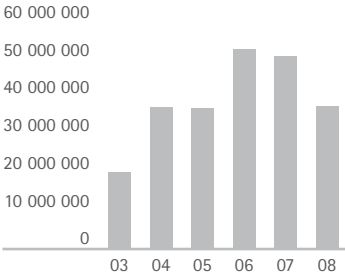


Water usage (kℓ per year)

The rising trend in water consumption by the Group is reversing, with consumption falling 14 per cent in 2008. AEL and Chemserve both achieved reductions. The shutdown of part of SANS's operations accounted for most of 2008's decrease.

Water usage by business (%)

There was a 27 per cent decrease in the Group's electricity consumption. AEL's consumption remained largely unchanged, as did that of Property, while Chemserve's usage fell by 18 per cent. The sale of Dulux in 2007 contributed to the Group's year-on-year reduction. The largest change however, occurred as a result of the shutdown of part of SANS's operations.

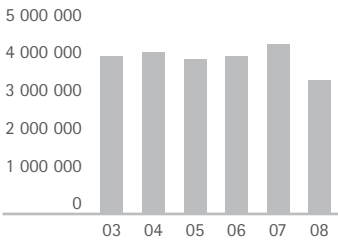


Electricity usage (KWh per year)

Electricity usage by business (%)

In addition to electricity, the Group's operations also consume energy in the form of coal, gas and fuel oil.

Total energy consumed in 2008 was 21 per cent lower than in 2007. This reduction was, by and large, due to the changes in electricity usage reflected above.

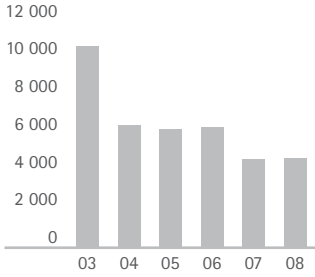


Total energy usage (GJ per year)

Total energy usage by business (%)

Hazardous waste generated by Group operations increased by 2 per cent in 2008. AEL recorded a significant improvement, after closure of the capped fuse plant and reduced production at the safety fuse plant.

This was more than offset, however, by a large increase in waste arisings from Chemserve. Most of this was due to unusually large amounts of waste from a subsidiary after a plant shutdown and from a clean-up exercise conducted at Chemserve's Chloorkop site. Again, the closure of certain SANS plants led to a large drop in total waste arisings.

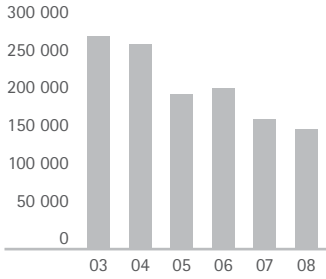


Hazardous waste arisings (tons per year)

Hazardous waste arisings by business (%)

The issue of global warming, with greenhouse gases being a major contributor, is receiving increasing attention. Most of this is focused on the burning of fossil fuels for energy, which generates carbon dioxide (CO_2).

Consequently, the potential for global warming is commonly expressed in terms of carbon dioxide equivalence. The Group's CO_2 emissions fell by 8 per cent in 2008. AEL achieved some reductions and SANS's emissions halved, for reasons already stated.



CO_2 arisings (tons per year)

CO_2 arisings by business (%)

Emissions other than CO_2 can also have a significant impact in terms of global warming potential.

Ammonium nitrate is used extensively in the explosives and fertilizer industries. It is manufactured from nitric acid and ammonia. AEL has two nitric acid plants at Modderfontein, the No. 9 and No. 11 plants. Nitrogen oxide gases are produced through the oxidation of ammonia on a platinum-rhodium metal catalyst gauze in the ammonia burners of AEL's nitric acid plants.

Most of the gas generated is in the form of nitric oxide, which is absorbed by water to form nitric acid. Some of the gas produced is in the form of nitrous oxide, which is typically released into the atmosphere as it does not have any economic value or toxicity at typical emission levels. However, it is a greenhouse gas with a global warming potential approximately 300 times per unit mass that of CO_2.

To combat global warming, a number of countries have ratified the Kyoto Protocol, thereby committing to reduce their emissions of greenhouse gases, or to engage in emissions trading were they to maintain or increase emissions of these gases.

Provision was made in the Kyoto Protocol for the registration of Clean Development Mechanism (CDM) projects, which allow participants in developing countries to generate Certified Emissions Reductions (CERs) by lowering their emission levels of greenhouse gases. CERs can then be sold to those entities that are under an obligation to reduce greenhouse gases but are unable to achieve the required reduction.

AEL has registered two CDM projects with the United Nations Framework Convention on Climate Change (UNFCCC). These are for the No. 9 and No. 11 nitric acid plants, and they were registered in November 2007 and February 2008 respectively. The projects involve the installation of secondary catalysts in the ammonia burners of the plants, below the primary gauze catalyst. This secondary catalyst decomposes the residual nitrous oxide without affecting the production of nitric acid.

The secondary catalyst in the No. 9 plant was installed in November 2007 but had to be removed in June 2008 when the method of installation caused the primary catalyst to fail on two occasions. AEL is currently exploring various alternatives to rectify this situation.

The project on the No. 11 nitric acid plant has been far more successful. The secondary catalyst was installed in September 2007 and has reduced nitrous oxide emissions consistently by 80 per cent. This plant has a production capacity about 2,5 times that of the No. 9 plant, meaning that the effect of the secondary catalyst on total emission levels is far greater than could be achieved on the smaller plant.

In 2008, these projects reduced the emissions of greenhouse gases from the nitric acid plants by the equivalent of 239 000 tons of CO_2. To put this in perspective, the reduction is significantly greater than the AECI Group's total CO_2 emissions of 153 000 tons in 2008.

Land remediation

The guiding principles underlying AECI's remediation activities are to protect human health and the environment; to use good science, proven concepts, and best available techniques not entailing excessive cost; and to work with regulatory authorities and share information with interested and affected parties.

A risk-based approach guides the remediation process and human health and environmental risk assessments are undertaken at appropriate stages in individual projects. These assessments influence subsequent activities.

Annual reviews of the Group's environmental liability have been conducted by independent consultants since 1995 and the level of detail increases each year. The reviews are a reasonable approach to quantifying the potential future liability that has resulted from past operations. It is assumed that good management and operating practices at current operating sites will reduce remediation requirements over time.

Liability review findings are used to plan detailed remediation projects and to motivate Group companies to initiate necessary remediation and environmental management activities. At end-2008, the environmental liability for the Group was estimated at R146 million for remediation.

Responsible Care*

Responsible Care* is the global chemical industry's voluntary initiative for continuous improvement of performance in safety, health and environmental practices. It is a public commitment to responsible management and stewardship of products and services throughout the lifecycle of products. It is also the vehicle used by the industry in its pursuit of improved performance in the areas of safety, health, the environment and product stewardship.

Responsible Care* was launched by the Canadian Chemical Producers' Association in 1984 and has now been adopted in 53 countries. The Chemical and Allied Industries' Association is the custodian of Responsible Care* in South Africa. In line with the guidelines of the International Council of Chemical Associations, the South African programme is based on eight fundamentals:

1. a formal commitment by each member company to a set of guiding principles;
2. a series of codes, guidance notes and checklists to help companies fulfill their commitment;
3. the development of indicators against which improvements in performance can be measured;