

Data and Trends

**Environmental protection
and Safety**

2006



EMS-GRIVORY Performance Polymers
EMS-GRIVORY Extrusion Polymers
EMS-GRILTECH
EMS-PRIMID
EMS-PATVAG
EMS-SERVICES

Data and Trends 2006

Protection of the environment and health and safety of our employees are factors given top priority by the companies of the EMS Group during manufacturing and distribution of their high-quality products in the fields of performance polymers, fine chemicals and engineering. As a supplement to our brochure, "Environmental protection and Safety", we also provide information about current trends and measures and take this opportunity to comment on changes and special events. These facts and figures refer to the business units EMS-GRIVORY Performance Polymers, EMS-GRIVORY Extrusion Polymers EMS-GRILTECH, EMS-PATVAG, EMS-PRIMID and EMS-SERVICES. These companies employ a total of 1200 workers at the production site in Domat/Ems.

Each graph shows the specific quantities which are used or produced during the manufacture of 1 ton of sales product. These figures are independent of quantities manufactured annually.

Starting with this reporting year, the quantities of finished products (sales quantities) have been taken as a basis for the ratio numbers and data from the previous year has been recalculated accordingly. This allows a comparison of the figures to be made.

Investments

Investments in safety and energy supply

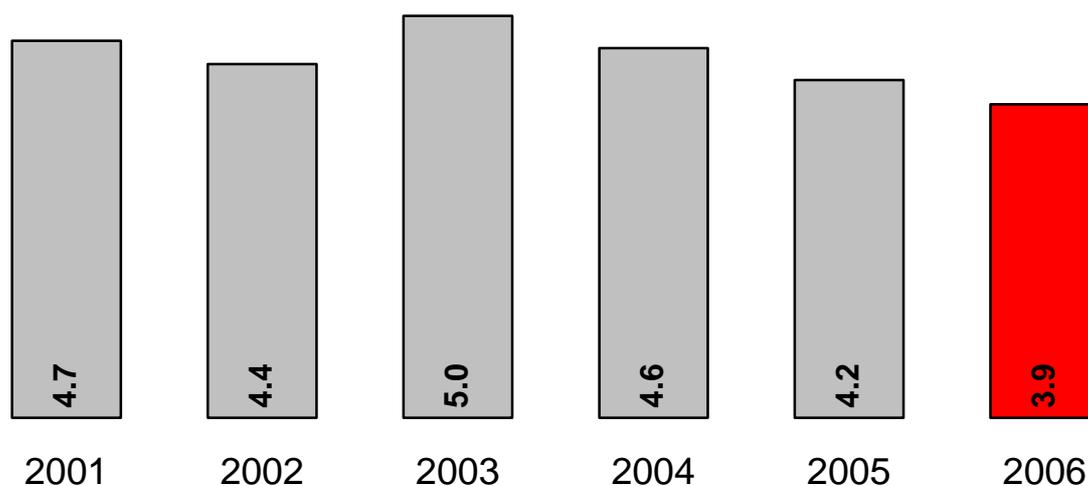
As in earlier years, the focus of investment in 2006 lay in the safety of employees, the environment and our plant equipment.

Particular attention was paid to ensuring safe loading and unloading of tank wagons and bulk containers. Fatal falls were able to be prevented through use of safety lines and rails and walkways. Ventilation and filter systems were improved where danger to health was possible from dust or vapours.

An additional fire truck was purchased for the works fire brigade. If incidents such as a fire, for example, can be brought quickly under control, no danger exists for the environment and plant equipment.

Important projects were realised in the field of energy supply and utilisation. The start-up of the independent company "Tegra Holz & Energie AG" has provided us with a source of process steam created from burning wood as a renewable raw material. The integration of this energy source into the steam network of the production site was one of the focus points of the investment plan. Together with this project, different investments in all business units were made towards improving utilisation of energy. In this way, the extract water concentration which will shortly be taken into operation, will use 87% less energy than the plant it replaces.

Share of E+S investments as a % of total investment

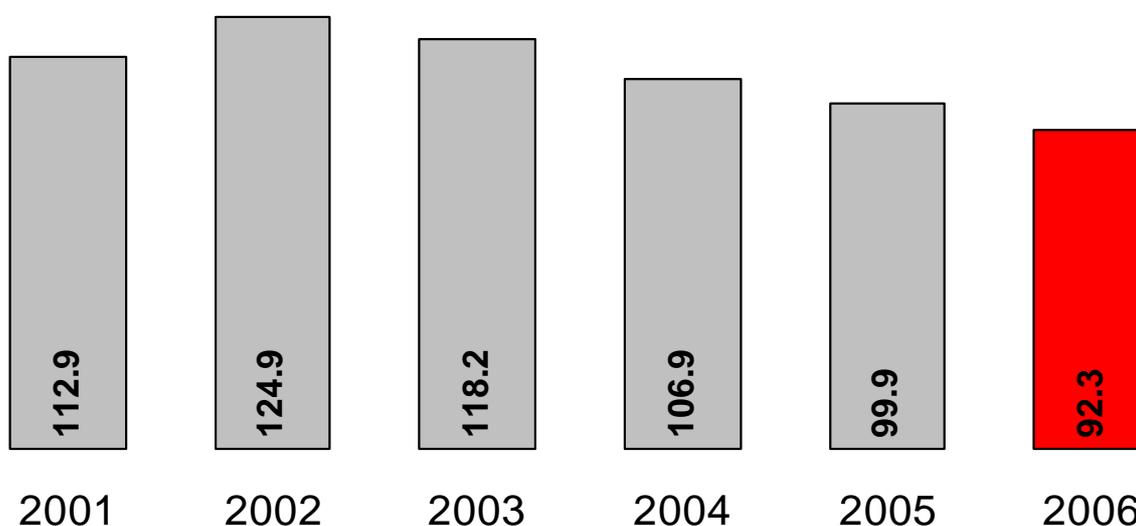


Operating expenses

Improved efficiency with lower outlay

Outlay towards protection of the environment is mainly made up of operating costs for the waste water and exhaust air cleaning plants and waste disposal management. Operating costs in the area of safety result mainly from measures to ensure protection of health, fire prevention, security and working safety (prevention of accidents). Costs for 2006 showed a slight drop. This trend was achieved through optimisation of waste disposal management and resulting lower costs for waste disposal.

E+S outlay CHF/t product



Energy

A great step towards the energy future

25% less energy per ton of product since 2001. Higher investment over the last years towards more efficient utilisation of energy has had a visible effect and we are proud of the result.

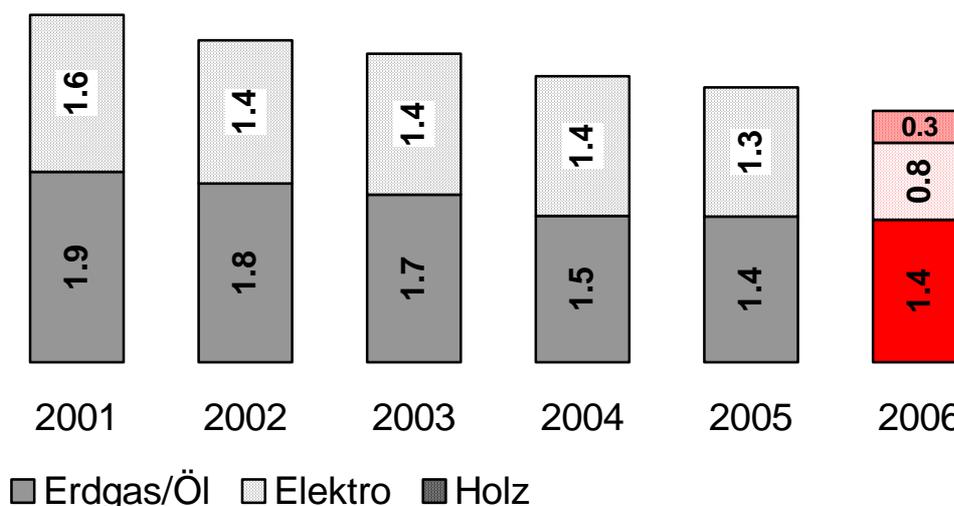
At the beginning of 2006 the first plant in the "Tegra - Holz & Energie AG", newly located on the EMS production site in Domat/Ems, was taken into operation. Already in the first twelve months, over 25% of the heat energy required for production processes is gained from this wood-burning power plant.

In this way, CO₂-output from heat generation has been reduced by 35% in comparison to the previous year.

Already during 2007, a further power-plant block will be taken into operation by the Tegra for the production of electricity and steam.

This means that the largest wood-fired power plant in Switzerland is located on the EMS-CHEMIE production site in Domat/Ems. In 2007, 65% of all process heat required for the production plants will be generated from the renewable raw material wood. The timber for fuel is either sourced directly from the woods in the Grisons area or from the neighbouring Stallinger Swiss Timber timber works.

MWh/t product



Manufacturing waste

Continued decreasing trend for hazardous waste

Our guiding principle is: Prevention before recycling and recycling before disposal.

According to this principle it is our on-going aim to avoid producing waste. Where this is not possible we look for solutions for material or thermal recycling.

Through improvements in waste management at the production site, 40% of all polymer manufacturing waste products can now be used as filler in other applications. The rest is used as fuel by cement manufacturers.

In this way, the amount of industrial waste disposed of in the waste incineration plant was able to be reduced by more than 50%.

65% of all waste produced on the production site is disposed of in material or thermal recycling.

The declining trend of the last years for hazardous waste, including used oil, solvents etc., continues. A further reduction of 5% compared to the previous year was achieved here.

kg/t product

Waste water

Water treatment at full capacity, improvement in sight

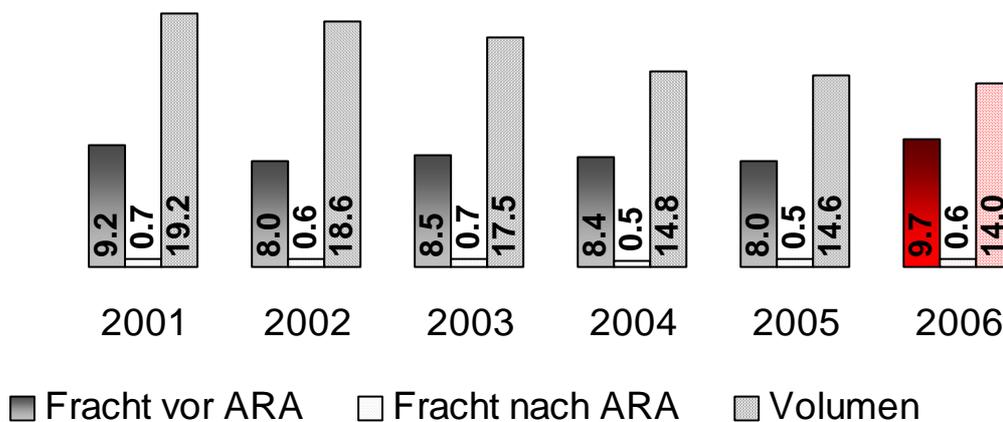
The specific waste water quantity arriving at our company-owned water treatment plant showed an increase of nearly 25% compared to the previous year. Among other things, this was due to conversion to a new extract water concentration plant. However, future prospects are good. Operation of this new plant will lead to a reduction in waste water load reaching the treatment plant in 2007. From 2008, a new production plant for recovery of the extract will start up operation. This will reduce the waste water load by a further 40%.

In addition to processing our industrial waste water, the company water treatment plant also separately treats waste water from the local towns of Rhäzüns, Bonaduz and Tamins. The dry sludge is dewatered and transported to other treatment plants for further processing. The gas generated during these processes is made use of directly in the water treatment plants and the dry sludge is used by a local cement work as a valuable alternative fuel source.

The graph shows the development of waste water quantities and wastewater load before treatment at our plant. As the water load is made up mainly of organic material, this is shown as TOC (total organic carbon).

Load in kg TOC/t product

Volumes in m³/t product



Air emissions

Reduced dust emissions

Using air-cleaning processes, we have been able to continuously reduce the total emissions from our production plants over the last four years. This improvement has been mainly due to reduction in emission of organic compounds.

During expansion of a production plant a new exhaust air cleaning plant was installed. This trend will also be continued next year.

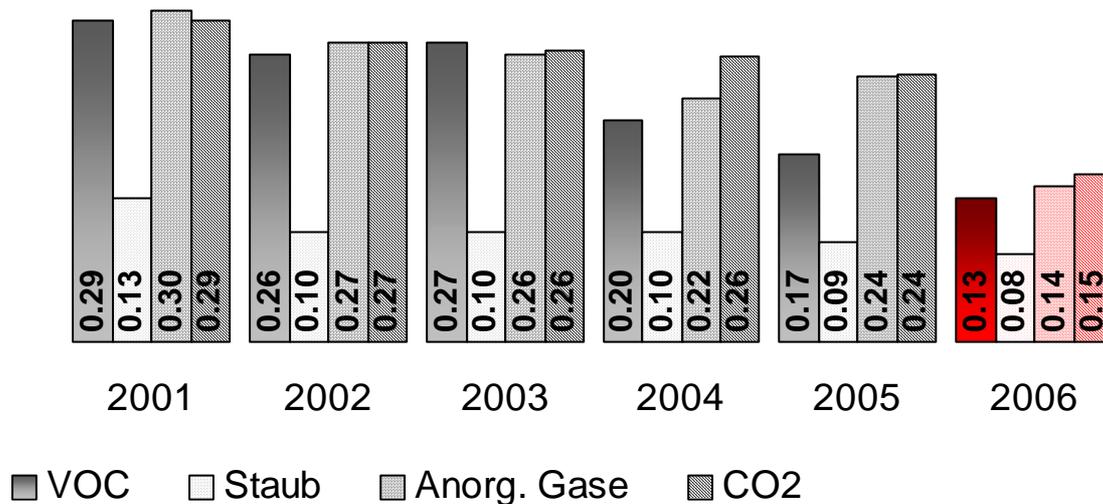
Emissions from the energy supply (boiler plants) are declining due to supply from the wood-heated biomass power plant and optimisation of energy consumption.

Emission of the "greenhouse gas" CO₂ is 35% lower than 12-months ago.

In order to allow a comparison of environmental factors, exhaust air emissions are given as an emission factor kg/t of manufactured product.

- The emission factor indicates the quantity of pollutant of a particular class which escapes into the air for each ton of product manufactured.
- VOC are volatile organic compounds such as solvents or secondary products from the manufacturing processes of our engineering plastics.
- Dust emissions are mainly fine particles which are not all collected in the exhaust air cleaners.
- Inorganic gases, mainly nitrogen oxide, are generated during combustion of natural gas for heating purposes.
- CO₂ is released during combustion of natural gas or heating oil for heating purposes.

Emission factor in kg/t product



Protection of health

Accidents can be prevented

The result of our intensive efforts towards accident prevention through technical, organisational and personnel measures can be seen in the steady decrease in the frequency of accidents occurring.

In comparison to the previous year, the number of work accidents was reduced by 26% as was the length of absence time due to accidents. The scale of severity of accidents was also reduced by 14%.

In contrast to this, no reduction can be seen in non-working i.e. leisure-time accidents. Based on this fact, it is our intention to continue the positive trend achieved with work accidents and through additional measures, to increase safety awareness of employees during their leisure time activities.

Work accidents per 1000 employees

