

Data and Trends

**Environmental Protection
and Safety**

2013



EMS-GRIVORY
EMS-GRILTECH
EMS-SERVICES

Data and Trends 2013

EMS works sustainably and responsibly. Protection of the environment and the health and safety of our employees is a major factor and is given top priority by the companies of the EMS Group during manufacturing and distribution of their high-quality products.

In addition to our brochure "Environmental Protection and Safety", we also provide information with our annual report Data and Trends. This concerns current developments and measures and allows us to comment on changes and special events. The data refers to the business units EMS-GRIVORY, EMS-GRILTECH and EMS-SERVICES. These companies employ around 1000 people at the production site in Domat/Ems.

The graphs show the specific quantities which are used or produced during the manufacture of one ton of finished product. These ratio figures are less dependent on the annual deviations of quantities manufactured.

2013 was characterised by investments to achieve technical process improvements and capacity increases in one of our main plants. This major project to avoid waste production, caused the investment share for environmental protection and safety (U+S) to increase to 12.4% in 2013. Despite more stringent requirements, it was possible to maintain the E+S operational costs at the same level as in the previous year.

The historical all-time low values for volumes of waste material and waste water load for 2013 are particularly pleasing. After a reduction of waste material of nearly one-third in 2012, it was possible to achieve a further 10% reduction in 2013. This means that the volume of waste produced in 2013 is the lowest figure since documentation was started.

Record values were also achieved for organic substances in waste water (waste water load) with -8% compared to the previous year.

As in earlier years, energy consumption at the site was further reduced. In 2013, mainly due to the effect of replacing old equipment with more energy efficient systems, savings were -8% compared to the previous year. In addition to this, further savings were achieved through successive replacement of conventional lighting technology with LED systems.

In 2013 it was possible to end the negative trend of the previous years with rising numbers of accidents. This reduction was achieved for both work-related accidents with loss of working hours (-10% compared to prev. year) as well as minor accidents without loss of working hours (- 8% compared to prev. year).

Investments

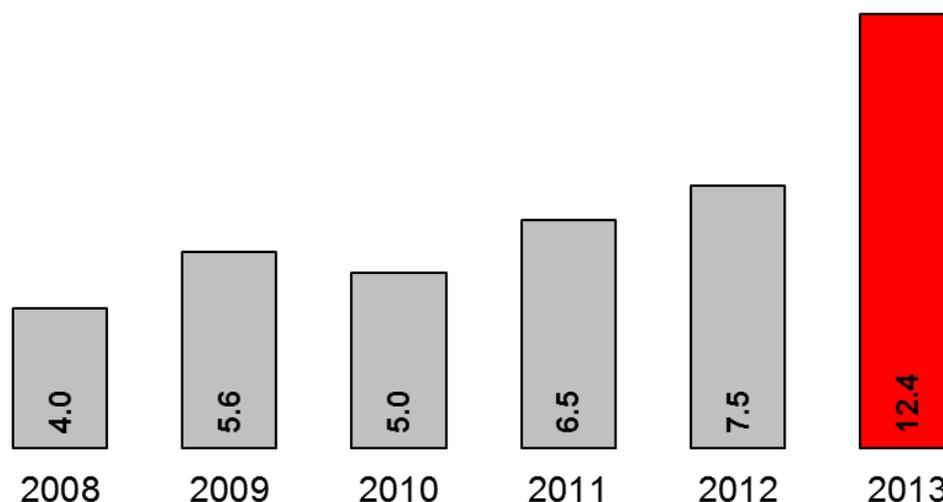
Less waste, more safety – a major project increases the E+S investment share

Investment activities in 2013 were characterised by a project to achieve technical process improvements in one of our main plants.

Following introduction of a globally unique production process developed by EMS, the manufacture of highly specialised polyamide materials can now be carried out with significantly lower volumes of waste material. This milestone means that production is now more economic and environmentally compatible than ever before. At the same time, this process also increases plant and operating safety.

The remaining minor projects achieved improvements in the areas of waste water, exhaust air and fire and explosion prevention.

Share of investment for environmental protection and safety in in % of all investments



Operating expenses

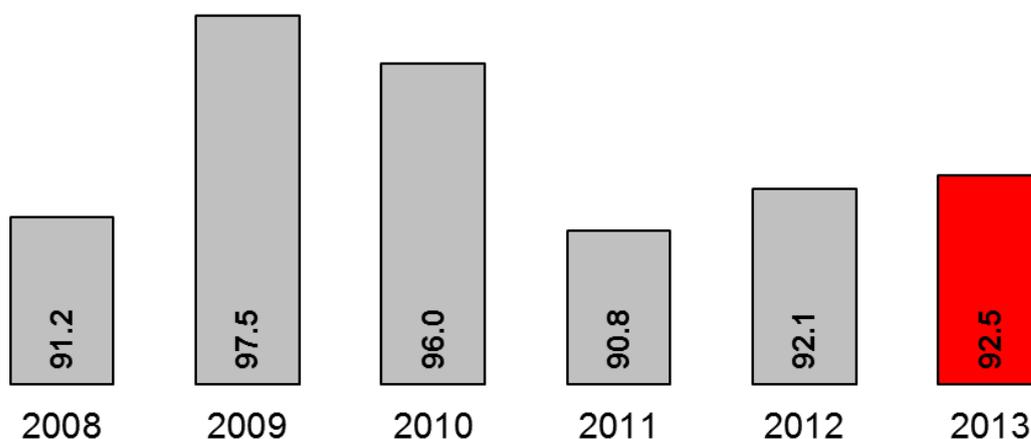
Expenses remain constant despite more stringent requirements

Outlay for environmental protection consists primarily of operating costs for waste water and exhaust air cleaning systems as well as the cost for waste management.

Operating costs in the field of safety result mainly from measures implemented to ensure protection of health, fire prevention, site security and working safety (accident prevention).

It was possible to avoid to a great extent an increase in costs due to additional tasks and directives in the field of waste management, emissions control and site security. This means that operating expenses overall have remained about the same as in the previous year.

E+S outlay CHF/t product



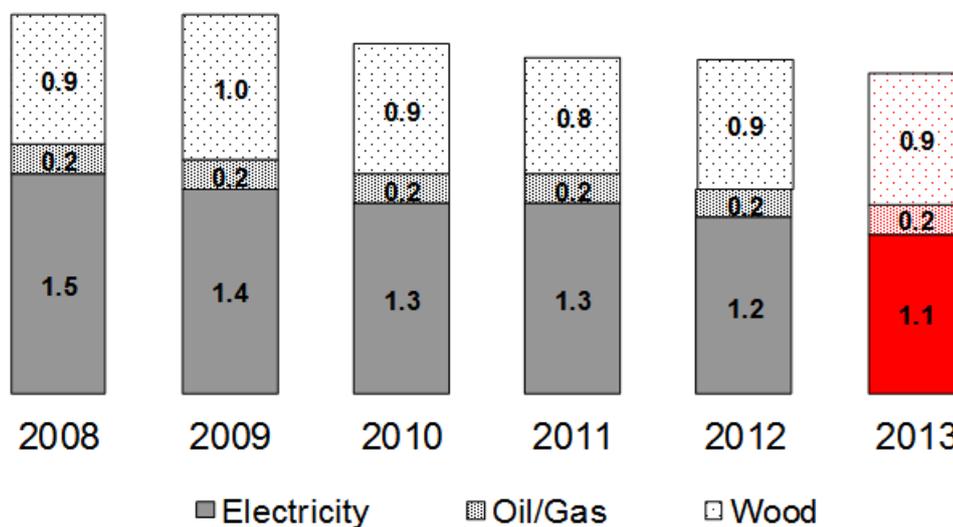
Resources

Energy efficient units and LED systems reduce energy consumption by 8%

Over the last years, electricity consumption of the production site has dropped continually and in proportion to replacement of old equipment, machinery and drive systems. In 2013, further replacement of old, energy-intensive equipment with new and energy-efficient units has had a significant influence again.

In addition, replacement of conventional lighting systems with LED technology has also had a visible effect. Equipping of production plants and storage facilities with energy-saving LED systems has been on-going since 2012. In 2013 the first outdoor lights and street lamps on the production site were also converted.

Energy consumption in MWh/t product



Manufacturing waste

Never before so little waste – Waste quantities sink to record low values

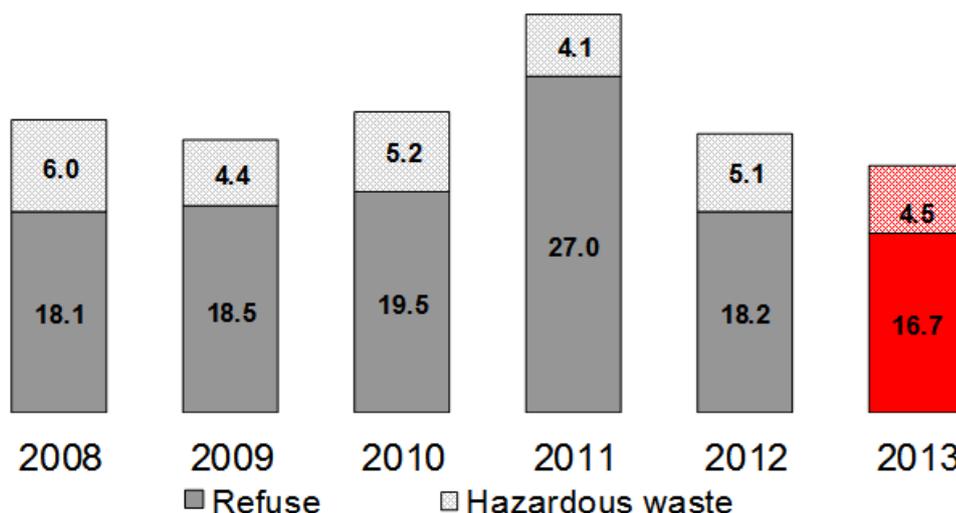
Compared to 2012, waste quantities were reduced by a further 10%. This means manufacturing has never been more economic with regard to resources.

Our waste management follows the principle of recycling before disposal. In 2013, more than 800 tons of recyclable materials such as metal, glass, wood, paper and packaging materials were separated from the waste for recycling. This corresponds to a recycling rate of 26%.

The major part of remaining refuse from the site is sent for incineration and replaces fossil fuels such as oil or gas in energy-intensive plants in the cement industry. Waste with less heating value is disposed of together with household refuse in incinerator plants.

The amount of hazardous waste remained at the same level as previous years and within normal production tolerances. All hazardous waste is disposed of solely by authorised disposal companies and only in facilities located in Switzerland and specialised in the treatment of this kind of hazardous waste.

kg refuse/t product



Waste water

Unchanged waste water volumes – water load never before so low

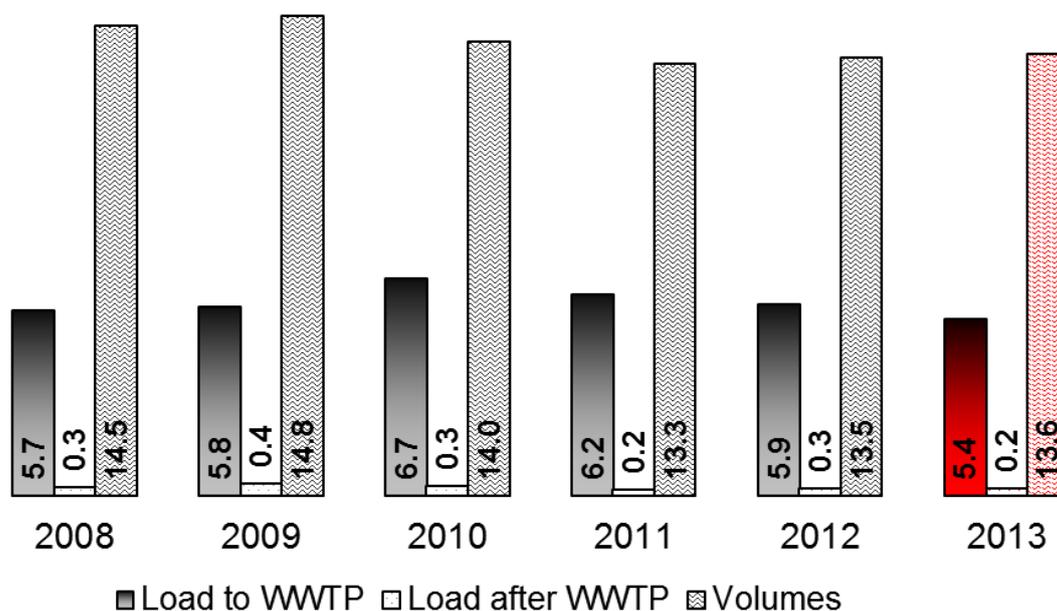
The graph shows the development of waste water quantities and waste water load before and after treatment at our treatment plant. As the water load is made up mainly of organic material, this is shown as TOC (total organic carbon).

In addition to processing our industrial waste water, the company's own waste water treatment plant (WWTP) also treats waste water from the local towns of Rhäzüns, Bonaduz and Tamins.

Following construction of a waste water pre-treatment plant at the production site, the amount of organic materials flowing to the WWTP was reduced by 8%. The cleaning performance of the WWTP was 96% TOC removal, which is a very high level. The quantities of waste water remained practically the same as in the previous year.

Sewage sludge has been dried internally by the company since 2012. This pre-treatment reduces transport volumes to the drying plant at Chur by around 4200 tons each year. Due to its good heat value, the dried sludge is used as an alternative fuel in the cement industry.

Load in kg TOC/t product
Volumes in m³/t product



Air emissions

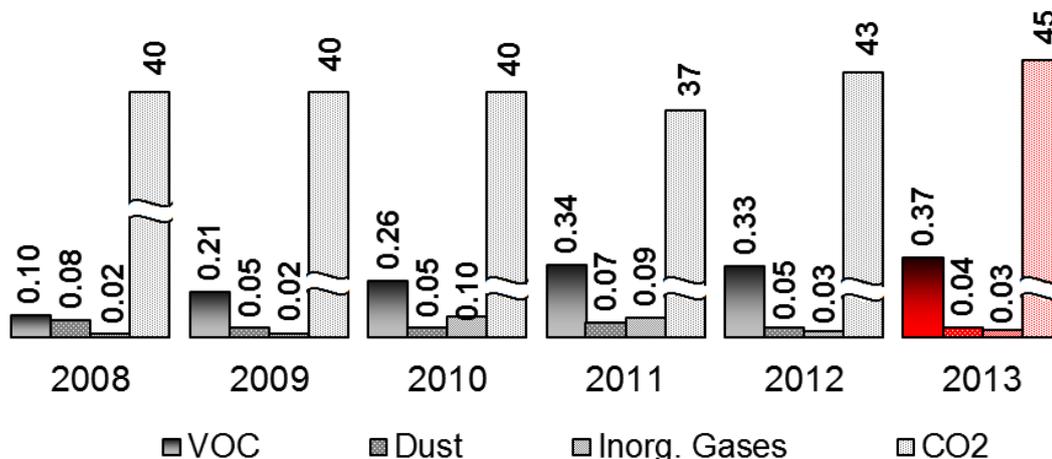
Air emission values similar to those of the previous year

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

- The emission factor indicates the amount of pollutant of a particular class which is released 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 performance polymers.
- Dust emissions are mainly fine particles caused by abrasion during the manufacturing process of the granules and from some solid raw materials.
- Inorganic gases, mainly nitrogen oxide, are generated during combustion of natural gas for heating purposes and from rail transport at the site
- CO₂ is released during combustion of natural gas or heating oil for heating purposes.

In 2013, manufacturing-related emissions produced at the production site remained at around the same levels as in the previous year. CO₂ emissions were 5% above those of this previous year, due to the longer heating period caused by cold weather.

Emission factor [kg/t product]



Health and safety

Turn-around achieved: A drop of 10% in work-related accidents

Through comprehensive efforts in accident prevention, we were able to stop the negative trend of increasing numbers of accidents over the last years.

The number of work-related accidents involving lost working hours per 1,000 employees dropped by 10% compared to the previous year. In addition, minor accidents with no loss of working hours were reduced by 8%.

The majority of accidents are still caused by tripping, slipping and falls on paths and stairs, as well as hand injuries when using machinery and tools.

The design and implementation of the prevention programme for 2014 was focussed on these causes. Our safety engineer planned the programme in close cooperation with experts from the SUVA (Swiss federal accident insurance). Defined main projects dealt with prevention of tripping and falls, efficient hand protection and stronger integration of safety as a leadership task.

Work-related accidents with loss of working hours/1,000 employees

