Data and Trends

Environmental Protection and Safety

2011

EMS-GRIVORY
EMS-GRILTECH
EMS-SERVICES

Data and Trends 2011

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 business fields of high-performance polymers and specialty chemicals. As a supplement to our brochure "Environmental Protection and Safety", we also provide information about current developments and measures and take this opportunity to comment on changes and special events. This data refers to the business units EMS-GRIVORY, EMS-GRILTECH and EMS-SERVICES. These companies employ a total of around 1000 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 finished product. These ratio figures are less dependent on the annual deviations in quantities manufactured.

2011 was characterised by several major projects to achieve capacity expansion. Despite the comprehensive construction activities towards this increase in capacity and with existing plants running at nearly full utilisation, an overall improvement in environmental protection was achieved. The cleaning performance as well as quantities of waste water were reduced and specific CO_2 emissions reached record low values in 2011.
The only negative point was the amount of waste material caused by start-up and trials run on the new plants.

Despite overall high investments in the expansion of the production plants, it was possible to significantly increase the investment share for environmental protection and safety in 2011.

Investments

Investments in energy efficiency, cleaning of exhaust air and work hygiene

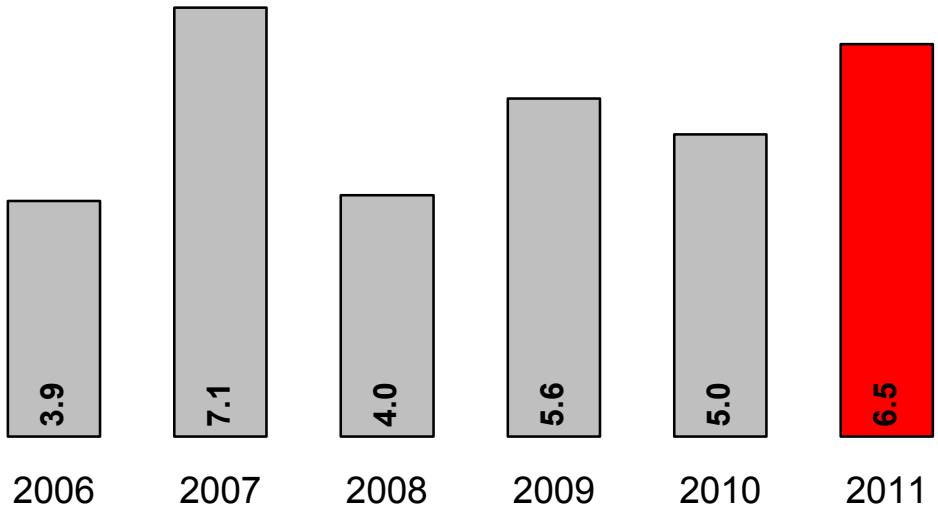
Focus point of investments in the area of environmental protection and safety (E+S) for 2011 was an improvement in the cleaning of exhaust air and work hygiene. To achieve this, a completely new process was developed which led to significantly lower dust emissions than the previous manufacturing process.

Older plants were also modernised in such a way that working conditions for employees could be further improved. These efforts were made both with regard to manufacturing processes as well as with ventilation of the buildings and work places.

Use of new engines and control systems, enabled us to achieve substantial reductions of specific energy consumption in various plants.

Further projects are currently being implemented which will lead to a continual reduction of exhaust air and improved working hygiene at the work place. These will only become completely effective during 2012. Various other projects are also being worked on to further reduce specific energy consumption of our production plants.

Share of investments for environmental protection and safety as a % of all investments



Operating expenses

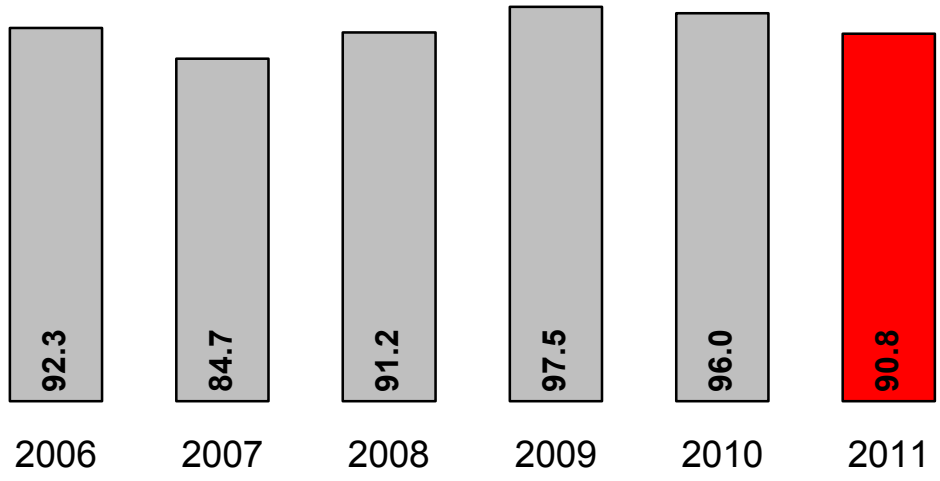
Efficiency from better utilisation

Outlay towards protection of the environment is mainly due to operating costs for waste water and exhaust air cleaning plants as well as 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).

Absolute costs remained at the same level as in the previous year while specific outlay was significantly reduced in 2011 due to higher capacity utilisation and increased sales volumes.

E+S outlay CHF/t product



Resources

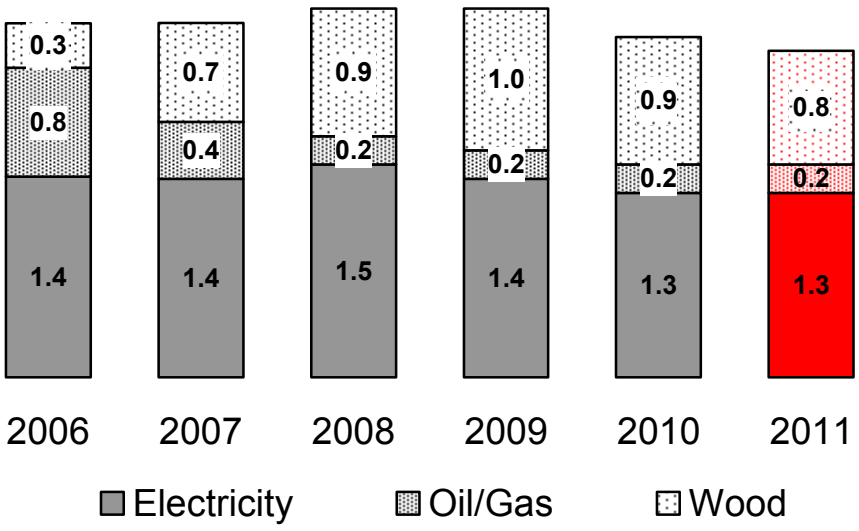
Energy savings despite capacity expansion

Further efficiency measures towards an ongoing reduction of energy consumption were implemented consistently in 2011.

It was possible to reduce overall energy consumption by another 5% compared to 2012.
In this way, already implemented energy efficiency measures have clearly over-compensated for increased consumption caused by the start-up of the new plants.

Projects to further optimise resource consumption will be continued in 2012. New measures have also been defined, in particular in the area of supply of liquid nitrogen to the production site and generation of compressed air supply and consumption and many have already been or are currently being implemented.

Energy consumption: MWh/t product



Manufacturing waste

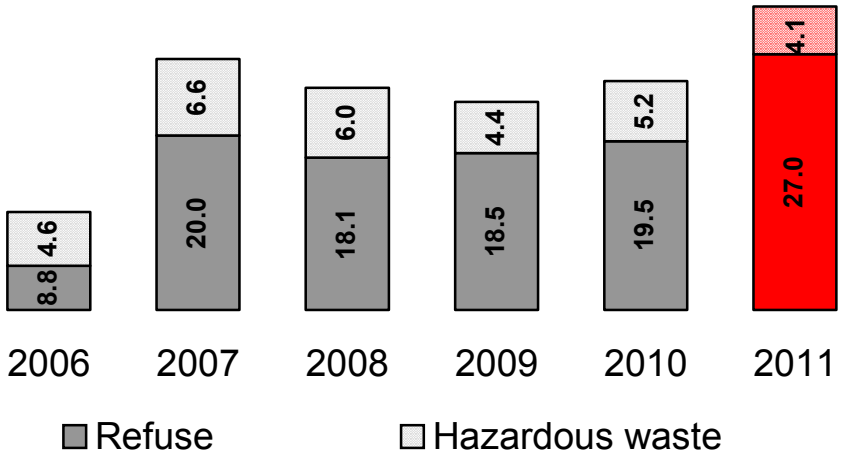
More plastic refuse – less hazardous waste

Our waste management follows the principle of material recycling before incineration or disposal.
In 2011, it was possible to separate a total of 1.8 tons of recyclable materials such as metal, glass, wood, paper and packaging materials from the refuse for recycling. The recycling quota in 2011 was 32%.

The major part of all waste produced on the production site is incinerated. As secondary fuels this waste replaces fossil fuels such as oil or gas in energy-intensive plants of the cement industry. Waste with less heating value is disposed of together with household refuse in incinerator plants. The share of plastic waste increased significantly in 2011 due to the start-up processes of new plants and increased activity in the pilot plants.

All hazardous waste generated at the production site is disposed of solely by authorised disposal companies and only in Swiss facilities for handling of hazardous waste. A significant improvement was achieved in the amount of hazardous waste generated. Despite expansion in production capacity, volumes of hazardous waste produced were reduced by 12% compared to 2010.

kg Refuse/t product



Waste water

Volumes of waste water reduced – cleaning performance improved

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

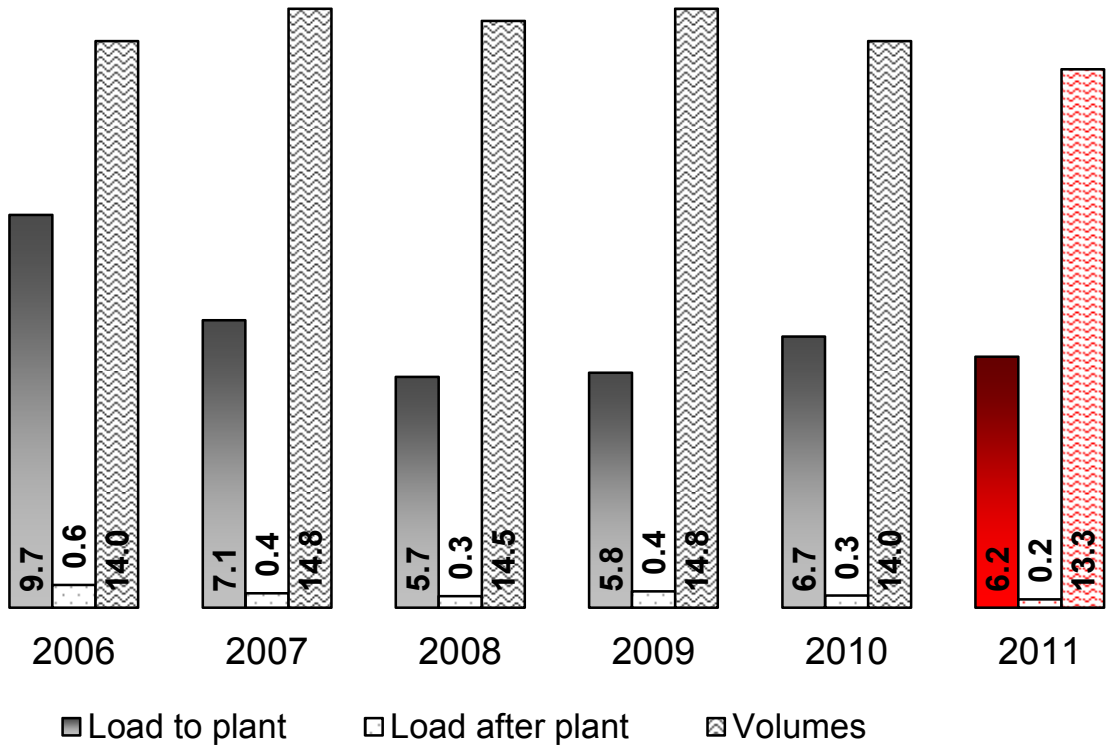
Despite the start-up of new production plants and higher capacity utilisation of existing plants, in 2011 we were able to reduce both waste water volumes and the load of total organic carbons (TOC) arriving at the water treatment plant.

With the start of operation of a sludge centrifuge in 2011, it became possible to improve removal of water from the sludge and to reduce the amount of sludge by 66%. As a result, around 200 truck loads of sludge to the drying plant in Chur are no longer necessary. The lower water content of the sludge also allows it to be dried and further processed to alternative fuel more efficiently.

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

The cleaning performance of the water treatment plant with regard to reduction of organic carbon in 2011 reached a new record level of 97%.

Load in kg TOC/t product
Volumes in m^3/t product



Air emissions

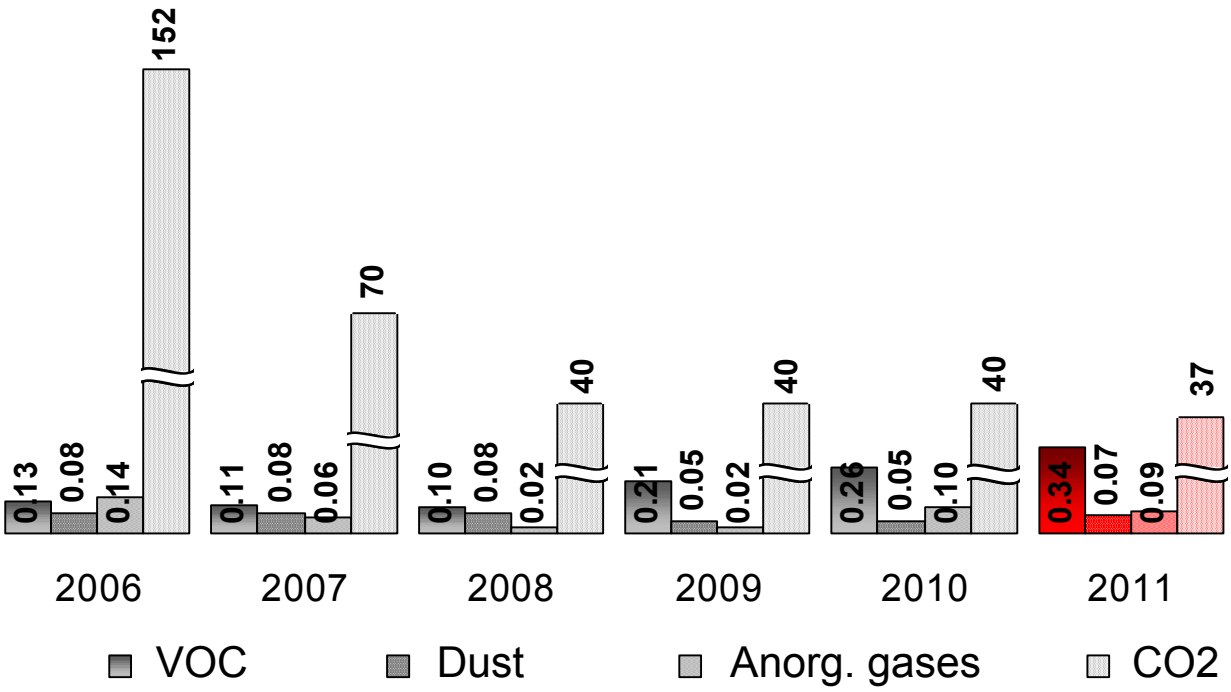
Specific CO_2 emissions at a record low

Efficiency improvement measures and high utilisation of the production plants allowed the specific CO_2 emissions to sink to a record low in 2011.
A slight increase to a still very low level was recorded for exhaust air containing solvents (VOC). The main reason for this was an increase in compilation of diffuse emission sources during handling, filling, storage and transport of our products.

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 performance polymers.
- Dust emissions are mainly fine particles which are not all collected in the exhaust air cleaners.
- Inorganic gases, mainly nitrogen oxides, 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 [kg/t product]



Protection of health

Reduction in non-work related accidents – slight increase in work-related accidents with loss of working hours

A sustained good performance was achieved with regard to non-work related accidents. For the last four years, the number of this kind of accident has continually dropped, showing an improvement in the safety awareness of employees. As these accidents occur outside working hours and with no direct work influence, the critical factor for success is the motivation of the employees to observe safety precautions.

In 2011, more work-related accidents with loss of working hours were recorded while the number of slight accidents with no loss of working hours decreased.

Precautionary issuing of a sickness certificate led to an increase in absences, increasingly also for less serious accidents, which were recorded as work-related accidents with loss of working hours. For just under 25% of all work-related accidents, absences were less than 1 working day, while for a further 20%, absences of less than 3 working days were registered.
In total, the accident statistics show a sideways movement for the last 5 years with periodical shifts between the two categories with and without loss of working hours.

In 2011, an additional safety engineer was recruited while safety campaigns, training and plant and building site audits were significantly increased.

Work-related accidents with loss of working hours / 1000 employees