

Bayer: Health, Safety, Environment Report 2004

TABLE OF CONTENTS

→ Assurance Statement

→ About the Report

→ Principal changes in 2004

→ General data

- Volume of products sold
- Employees

→ Summary of key performance indicators

SAFETY

- KPI Industrial injuries to Bayer employees leading to days of absence
- KPI Reportable industrial injuries suffered by Bayer employees
- Industrial injuries to contractor employees leading to days of absence
- Industrial injuries with fatal outcome
- KPI Major environmental incidents
- KPI Transportation incidents

EMISSIONS AND WASTE

→ Emissions into the air

- KPI Direct emissions of greenhouse gases (as CO₂ equivalents)
- KPI Emissions of volatile organic compounds (VOCs)
- Emissions with ozone depletion potential
- Further emissions into the air

→ Emissions into water

- KPI Total phosphorus
- KPI Total nitrogen
- Further emissions into water

→ Waste volumes

- Total waste generated
- KPI Generation of hazardous waste
- Waste disposal
- KPI Hazardous waste transferred to landfill

USE OF RESOURCES

- KPI Water use
- KPI Energy use

→ GRI Index

You can also call up particular sections of the document. Please click on the desired heading in the table of contents.



Introduction

We have reviewed Bayer Group annual HSE performance data collection procedures for the reporting period 2004 as described in the internet-based 2004 HSE performance data report (the 'Report'). These are the responsibility of the Bayer AG Group Management, with whom the objective and terms of the engagement were agreed. We are responsible for expressing our conclusions based on the engagement.

We have based our approach on emerging best practice for independent assurance on HSE reporting, including ISAE 3000 ("Assurance Engagements other than Audits or Reviews of Historical Financial Information"), issued by the International Auditing and Assurance Standards Board (IAASB).

Subject matter

The following subject matters were reviewed:

- The procedures and practices, as described in 'About the Report', for the annual collection, compilation and validation of 2004 data from reporting objects on HSE data.
- The presentation of the above mentioned data in the HSE Report in accordance with criteria described in 'About the Report'.
- The implementation of the above subject matter at eight reporting objects selected by us in consultation with Bayer AG: We visited Bayer HealthCare Leverkusen (Germany), Bayer Industry Services Uerdingen (Germany), Bayer CropScience Vapi (India), Bayer MaterialScience Baytown (US), and we engaged by phone and other means of communication with: Bayer HealthCare Beijing (China), Bayer Technology Services Lerma (Mexico), Bayer MaterialScience Antwerp (Belgium), Bayer CropScience Villefranche (France).

Procedures

Our objective was to achieve limited assurance. Based on an assessment of materiality and risk, we have gathered and evaluated evidence supporting the conformity with criteria for the subject matters described. This work included analytical procedures and interviews with management representatives and employees at Bayer AG Group headquarters in Leverkusen and at the eight reporting objects mentioned above. These were performed on a sample basis, as we deemed necessary in the circumstance, but no substantial testing was undertaken. Therefore, the assurance that we obtained from our evidence gathering procedures is limited. We believe that our work provides an appropriate basis for our conclusion.

Conclusions

In conclusion, in all material respects, nothing has come to our attention that causes us not to believe that:

- Bayer AG at Group level has applied detailed and systematic procedures for the purpose of collecting, compiling and validating 2004 HSE performance data from reporting objects, as specified.
- The HSE performance data mentioned above have been appropriately presented in the HSE Report in accordance with principles stated in 'About the Report'.
- The eight reporting objects mentioned above have implemented the Group requirements to appropriately prepare and report to Bayer AG at Group level the requested performance data for HSE 2004 on environmental protection, health and safety.

Leverkusen, July 11, 2005

DELOITTE Statsautoriseret Revisionsaktieselskab

Preben J. Sørensen

Danish State Authorized Public Accountant

Environment & Sustainability Services

This report gives information on HSE (Health, Safety and Environment) performance indicators for the Bayer Group for the reporting period 2004. With this document Bayer continues the series of publications that were up to now published every few years in the form of the Sustainable Development Report (last published in June 2004 for the years 2001-2003).

With regard to the recording and presentation of the data, we aligned ourselves to international recommendations and guidelines such as those of the Global Reporting Initiative (GRI), the World Business Council for Sustainable Development (WBCSD) and the European chemical association CEFIC. We have appended a GRI index at the end of the report indicating which GRI indicators were included. The process of data recording and preparation was aligned to internal guidelines and directives. The main components of the process were implemented as part of a Group-wide IT solution. Internally, responsibility for releasing the data lay with the Head of Governmental and Product Affairs of Bayer AG.

All Bayer sites including those used purely for research and administration and warehouses were included in the data recording process. This process aligned itself to the new Bayer structure of subgroups and service companies. So-called reporting objects were therefore established for every subgroup and every service company at each geographical site. In total, data from 450 reporting objects were recorded. As in previous years, the data were collected using an electronic questionnaire addressed to all Bayer sites of which the Bayer Group owned at least 51 %.

Deloitte was asked by Bayer to review the data recording process and the quality and credibility of the data duly achieved by way of an assurance process. In addition to an examination of the data recording system, the assurance process involved interviews with relevant personnel at various levels, particularly interviews at and visits to the sites that provided the data. A total of eight reporting objects on four continents were the subject of a spot check.

Site	Country	Subgroup/Service Company
Leverkusen	Germany	Bayer HealthCare
Uerdingen	Germany	Bayer Industry Services
Baytown	USA	Bayer MaterialScience
Vapi	India	Bayer CropScience
Villefranche	France	Bayer CropScience
Beijing	China	Bayer HealthCare
Antwerp	Belgium	Bayer MaterialScience
Lerma	Mexico	Bayer Technology Services

Due to the recent establishment of the LANXESS organization, data recording for the reporting objects that form LANXESS was carried out in a separate process. The assurance therefore solely relates to the data of the new Bayer Group, and not to the data of the LANXESS subgroup that are also presented below.

Approximately half way through 2004, LANXESS was formed out of the former Bayer subgroups Bayer Chemicals and Bayer Polymers. As a result, it was necessary to form new reporting objects, by subdividing and merging. The data collected at these new reporting objects relate to the entire year 2004, as if the reorganization had already taken place on January 1, 2004.

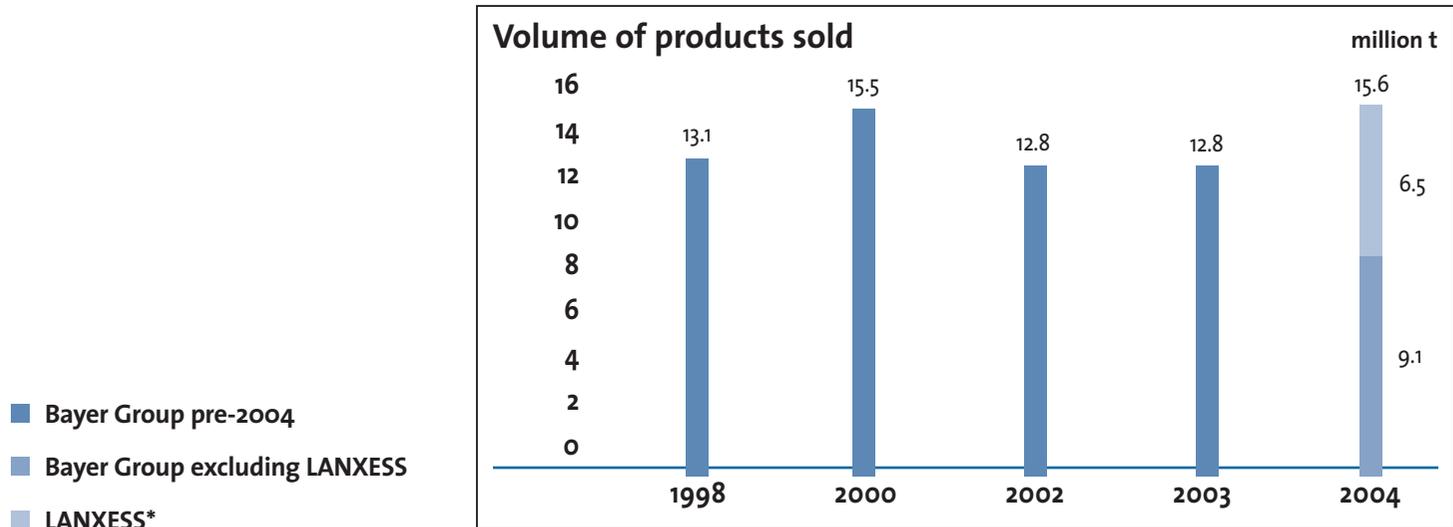
LANXESS is presented separately below, for two reasons:

- The company became legally independent effective January 31, 2005. By presenting LANXESS separately, values related to the Bayer Group were determined for 2004 that could then be compared with the values for the subsequent year.
- Due to the recent establishment of the LANXESS organization, data recording for LANXESS was carried out in a separate process. The Assurance therefore solely relates to the data of the new Bayer Group, and not to the data of the LANXESS subgroup.

The diagrams and graphs below show the data for 2004, subdivided into the new Bayer Group that has existed since January 31, 2005 and LANXESS.

With the exception of this change, relevant only internally, there were no significant changes to the scope of the data collection in relation to 2003. For that reason we chose not to present a separate figure for continuing operations.

Volume of products sold



* LANXESS data were not subject to the assurance process

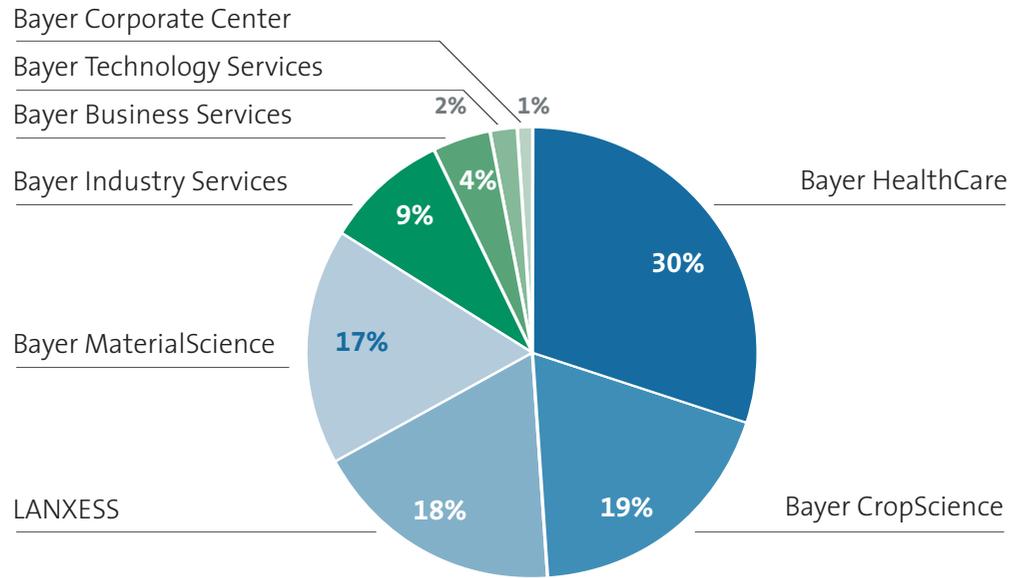
The volume of products sold in 2004, at 15.6 million metric tons, was substantially higher than in 2003. Despite a considerable increase in production volume of 22 percent it has been possible to maintain the previous years' low levels of emissions and waste so that the specific emissions per kilogram or metric ton of product have effectively been reduced by a significant degree. This has been achieved, for example, through continuous advancements in environmental protection, improved processes and rigorous application of recycling options.

Employees

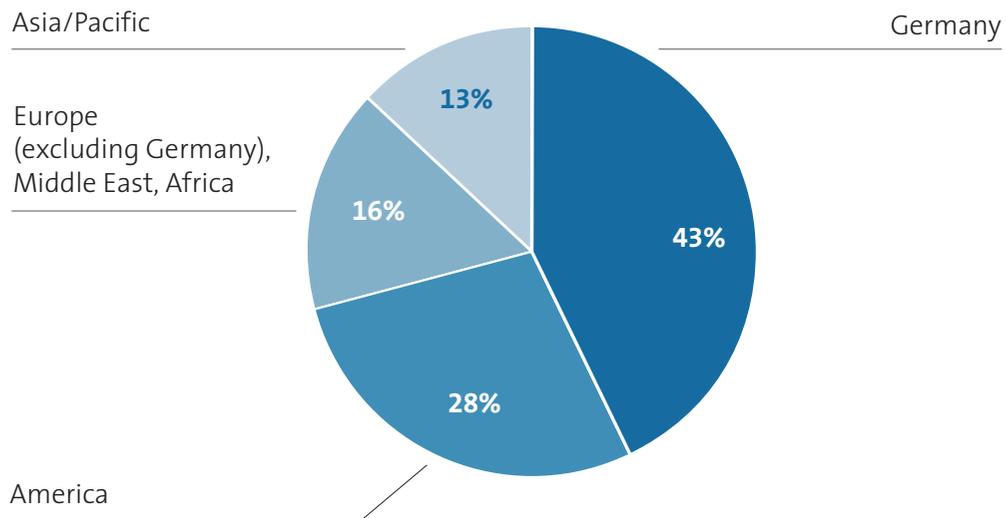
As part of our HSE performance reporting procedure, we not only report on the permanent workforce, but also on all employees who report directly to Bayer personnel, such as short-term employees and placement students etc., who do not form part of the permanent workforce and contractors reporting directly to Bayer employees. For this reason, the figures presented here are generally higher than those reported in other Bayer publications that relate only to the permanent workforce.

Compared to the previous year, the number of employees determined in this way decreased from 115,388 to 111,946.

**Number of employees as at December 31, 2004,
subdivided according to subgroup or service company**



**Number of employees as at December 31, 2004,
subdivided according to region**



Summary of key performance indicators

[→ Table of Contents](#)

Category	Indicator	2003	2004		
			Bayer Group	Bayer Group excluding LANXESS	LANXESS*
Safety	Industrial injuries to Bayer employees leading to days of absence (number of accidents per 1 million hours worked)	3.4	2.7	2.7	2.7
	Reportable industrial injuries suffered by Bayer employees (number of accidents per 1 million hours worked)	7.2	—	4.7	Not recorded
	Major environmental incidents	21	15	6	9
	Transportation incidents	28	12	11	1
Emissions and waste	Emissions into the air				
	Emissions of greenhouse gases as CO ₂ equivalents in million t/a**	5.4	5.6	4.2	1.4
	Emissions of volatile organic compounds in 1,000 t/a	10.7	9.9	4.5	5.4
	Emissions into water				
	Total phosphorus in 1,000 t/a	0.6	0.83	0.76	0.07
	Total nitrogen in 1,000 t/a	3.2	2.8	0.9	1.9
	Hazardous waste				
	Hazardous waste produced in million t/a	0.5	0.46	0.3	0.16
	Hazardous waste transferred to landfill in million t/a	0.2	0.17	0.12	0.05
	Use of resources				
Water consumption in million m ³ /d		2.1	2.3	1.4	0.9
Energy consumption in petajoules (10 ¹⁵ Joule)/a		141	150	97	53

* LANXESS data were not subject to the assurance process

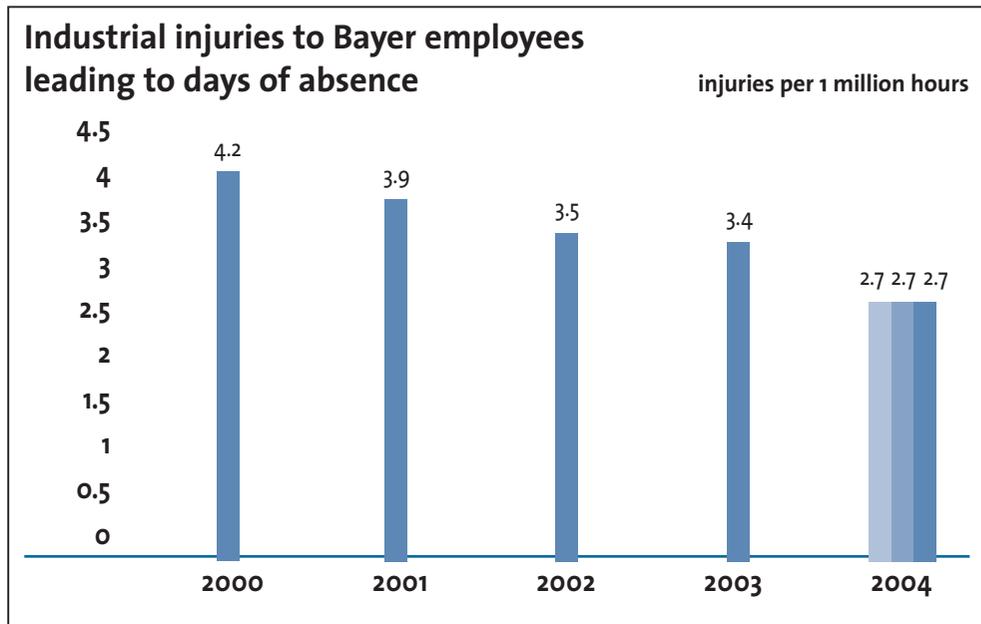
** Emissions of Greenhouse Gases per Metric Ton of Product Sold

	2003	2004
Emissions of greenhouse gases as CO ₂ equivalents in million t/a	5.4	5.6
Volume of products sold in million t/a	12.8	15.6
Emissions of greenhouse gases as CO ₂ equivalents per metric ton of product sold in metric tons of CO ₂ equivalent per metric ton of product sold	0.42	0.36

Key performance indicator – Industrial injuries to Bayer employees leading to days of absence

This indicator covers the number of industrial injuries to Bayer employees leading to days of absence, per million hours worked. The data collected also include staff with limited term contracts, part-time staff and contractors reporting directly to Bayer employees.

The injury rate fell once more in 2004 from 3.4 to 2.7. This can be attributed to efforts for further improvements in workplace safety in all subgroups and service companies. In 2000, the injury rate was still 4.2.



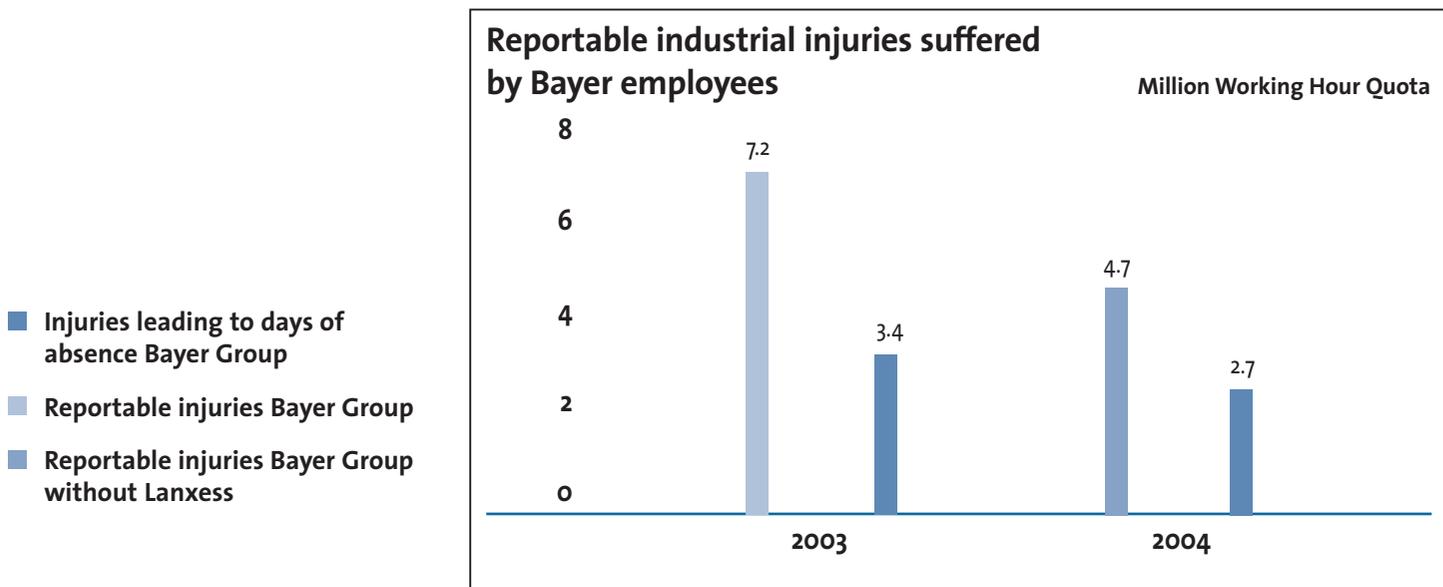
- Bayer Group
- Bayer Group excluding LANXESS
- LANXESS*

*LANXESS data were not subject to the assurance process

Key performance indicator – Reportable industrial injuries suffered by Bayer employees

The data inform about the number of industrial injuries suffered by Bayer employees requiring medical treatment (whether or not leading to days of absence) per million hours worked (injuries leading to days of absence therefore form a subset of reportable injuries). The data collected also include staff with limited term contracts, part-time staff and contractors reporting directly to Bayer employees.

This value was calculated for the first time in 2003. In 2004, reportable accidents were only recorded in those areas that formed part of the new Bayer Group as of January 31, 2005. No figure is available in relation to LANXESS.



Industrial injuries to contractor employees leading to days of absence

The data inform about the number of industrial injuries suffered by employees of contractors (not directly reporting to Bayer personnel) leading to days of absence, per million hours worked.

Compared to the previous year, the number of industrial injuries suffered by employees of contractors was once again higher, after having been considerably lower up to 2003, when compared to the reference year 2000. This increase can be explained by an improved recording practice in some areas.



- Bayer Group
- Bayer Group excluding LANXESS
- LANXESS*

*LANXESS data were not subject to the assurance process

Industrial injuries with fatal outcome

In 2004, there were 5 fatalities among Bayer Group employees and two fatalities among employees of contractors. The rise in this figure cannot be attributed to one single event, but relate to several tragic accidents. Road accidents of sales staff play a significant role in this year's increase.

Industrial injuries with fatal outcome					
	2000	2001	2002	2003	2004
Bayer employees – pre-2004 Bayer Group	3	2	0	1	-
Bayer employees – Bayer excluding LANXESS	-	-	-	-	4
Employees of contractors working for pre-2004 Bayer Group 2004	1	1	1	1	-
Employees of contractors working for Bayer excluding LANXESS	-	-	-	-	1
LANXESS employees*	-	-	-	-	1
Employees of contractors working for LANXESS*	-	-	-	-	1

*LANXESS data were not subject to the assurance process

Key performance indicator – Major environmental incidents

During the 2003 reporting year, environmental incidents were subdivided into three sub-categories, in line with a definition used throughout the Group. Incidents that were to be assigned to the first two levels are reported in the form of the key performance indicator “major environmental incidents”.

In 2004, there were considerably fewer incidents that comply with the definition of any of the three levels. As a result, major environmental incidents (the total of level 1 and 2 incidents) went down from 21 to 15.

In the case of years prior to 2003, the only incidents that were recorded were those that occurred at production sites and which had to be notified to the authorities, in accordance with national regulations. For this reason, the figures for the years in question cannot be compared directly to the current parameters of “reportable environmental incidents” and “incidents causing damage”. In 2000, for example, we recorded 69 reportable environmental incidents and 7 incidents causing damage.

Major environmental incidents					
	2000	2001	2002	2003	2004
Reportable environmental incidents	69	47	53	-	-
Incidents causing damage	7	1	4	-	-
Major environmental incidents					
– Bayer Group	-	-	-	21	15
– Bayer Group excluding LANXESS	-	-	-	-	6
– LANXESS*	-	-	-	-	9

*LANXESS data were not subject to the assurance process

Key performance indicator – Transportation incidents

Transportation incidents are recorded in accordance with a new definition that will replace the current definition specified by the CEFIC (European Chemical Industry Council). It defines transportation incidents more stringently than CEFIC, as there is no initial threshold with regard to leakage of chemicals.

If we compare 2003 and 2004, there was a considerable reduction from 28 to 12. A changed recording practice also plays an important part in explaining this difference: Transportation incidents are only recorded in our statistics in cases where transported goods were owned by a Bayer company. In the years before, ownership of transported goods was not relevant when recording transportation incidents.

The quantity of goods transported totalled 128 million metric tons.

Transportation incidents					
	2000	2001	2002	2003	2004
Road	26	16	23	28	10
Rail	2	0	2	0	0
Internal waterways	2	1	0	0	0
Sea	2	0	0	0	0
Air	1	0	0	0	1
Pipeline*	0	1	1	-	-
LANXESS**	-	-	-	-	1
Bayer Group excluding LANXESS	-	-	-	-	11
Total Bayer Group	33	18	26	28	12

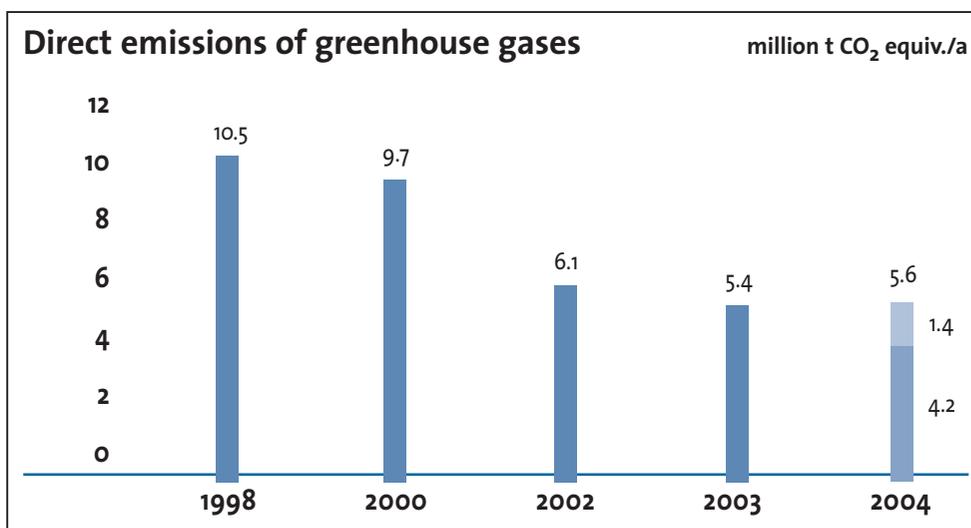
* Following the carve-out of EC, we no longer possess a pipeline.

** LANXESS data were not subject to the assurance process.

Emissions into the air

Key performance indicator – Direct emissions of greenhouse gases (as CO₂-equivalents)

Using this indicator we record the sum total of direct emissions of greenhouse gases as defined in the Kyoto Protocol (carbon dioxide CO₂, methane CH₄, dinitrogen monoxide N₂O, partially fluorinated hydrocarbons, perfluorohydrocarbons, sulfur hexafluoride SF₆), converted to CO₂ equivalents.



- Bayer Group pre-2004
- Bayer Group excluding LANXESS
- LANXESS*

* LANXESS data were not subject to the assurance process.

Direct emissions of greenhouse gases originate from power stations, waste incinerators and production plants.

In 2004, emissions remained at around the same level as in 2003. Approximately 90 % were CO₂ emissions; slightly more than 7 % took the form of dinitrogen monoxide (laughing gas) and less than 3 % other greenhouse gases.

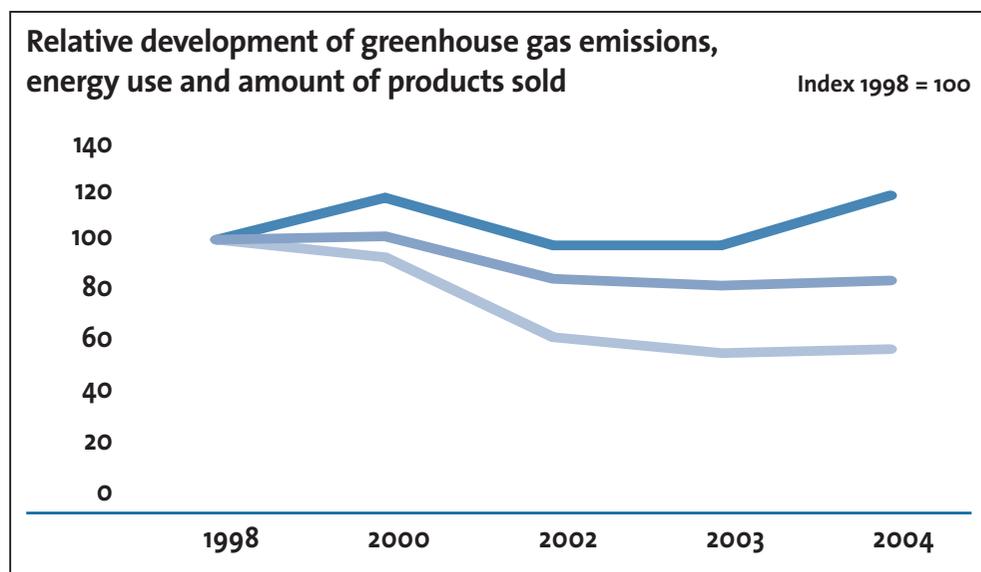
The period between 1998 and 2004 saw a reduction of greenhouse gas emissions from 10.5 million metric tons to 5.6 million metric tons per annum. This corresponds to approximately 47 %. The Bayer Group had set itself the target of reducing its emissions of greenhouse gases by 50 % by 2010, when compared to the same figure for 1990. Up to 2004, direct emissions of greenhouse gases went down by 63 % in relation to the reference year of 1990.

The level of greenhouse gases has been reduced on the one hand by targeted measures such as the thermal degradation of dinitrogen monoxide (laughing gas) and the reduction of CO₂ emissions by means of more efficient technology for transforming and using energy (such as gas turbines for energy generation, membrane technology for electricity intensive chloralkali electrolysis).

On the other hand, structural changes had and still have an effect upon our greenhouse gases balance sheet, shifting some emission sources outside the boundaries of our reporting scope. This resulted in the most substantial decrease following the divestment of EC-Erdölchemie in 2001. The CO₂ emissions of that company alone totalled 3,1 million metric tons. The transfer of the power station to an energy supply company gave rise to a reduction in Bayer's greenhouse gases balance sheet of approximately 1 million metric tons of CO₂ in 2000. The reason for this outsourcing is that energy supply companies can generally ensure better utilization and therefore a more efficient use of a power station.

With regard to volume of products sold, the direct emissions of greenhouse gases by the Bayer Group were reduced as a result of the changes described above during 2004 to 0.36 t CO₂ equivalent / t product. This corresponds to a reduction compared to 1998 (0.8 t CO₂ equivalent/t product) of 55 %.

By far the greatest proportion of greenhouse gas emissions are caused by energy generation from fossil fuels and have therefore been correlated against the volume of energy consumed. As a result of the measures described above, they fell more significantly, however, than energy consumption itself, which at increasing volume of products sold was down by approximately 20 % in relation to 1998, while greenhouse gases decreased by almost 50 %.



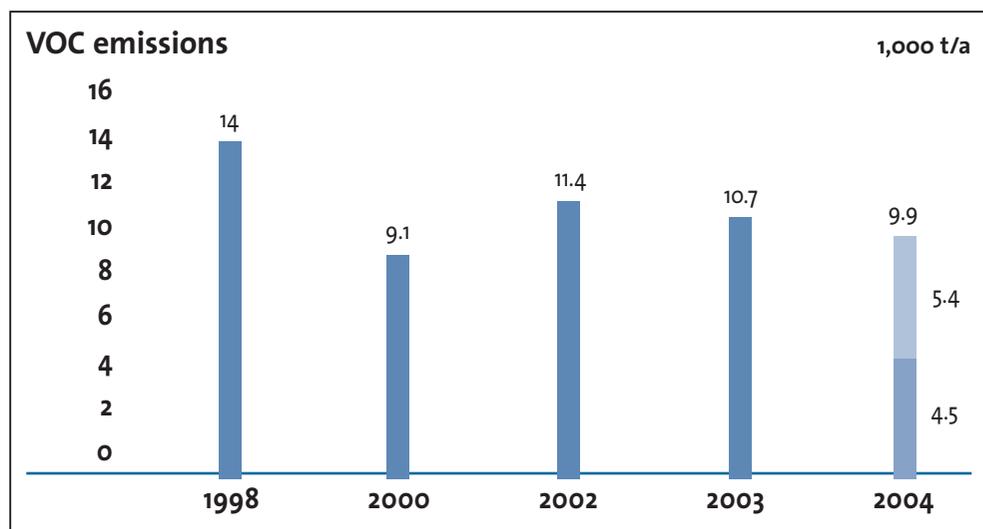
- Products sold
- Energy use
- Greenhouse gas emissions

Key performance indicator – Emissions of volatile organic compounds (VOCs)

The total of all volatile organic compounds is determined. VOCs are organic chemicals with a vapor pressure of at least 0.001 kPa at 20 °C. Methane or acetone are not regarded as VOCs, as they do not contribute to the formation of smog or ozone.

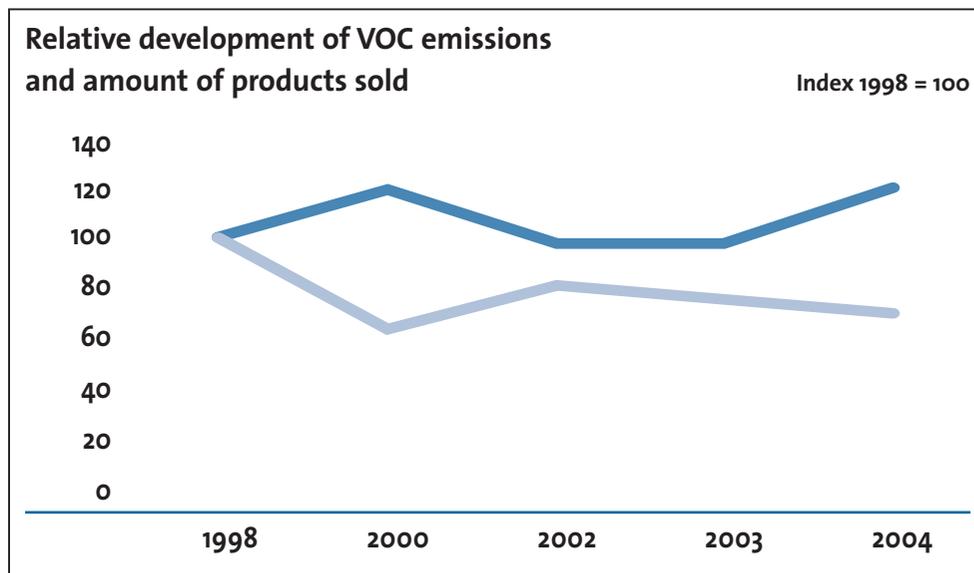
Emissions of VOCs in 2004 were slightly less than in 2003.

From 1998 to 2004, a reduction of 29 % in the emissions of volatile organic compounds was achieved. As a result of the acquisition of Aventis CropScience (ACS), VOC emissions had risen from 9,100 t/a to 11,400 t/a between 2000 and 2002.



*LANXESS data were not subject to the assurance process

The considerable reduction in VOC emissions was achieved despite a rise in product emissions during the same period.



- Products sold
- VOC emissions

Emissions with ozone depletion potential

Under this category we summarize substances which may damage the ozone layer in the upper atmosphere protecting the earth's surface from solar radiation.

In order to record the ozone-depleting effect of substances in a comparative manner, an ozone depletion coefficient is assigned to each of these substances. The ozone depletion coefficient is given as a relative quantity that relates to the potential of a reference substance. This reference substance is trichlorofluoromethane (CFC-11). The total of all substances with ozone depletion potential is indicated in the form of a total CFC-11 equivalent.

The significant reduction from 41 to 34 metric tons in 2004 has been achieved by restrictions for the use of such substances at Bayer MaterialScience and LANXESS.

Emissions with ozone depletion potential

in t/a	2002	2003	2004		
			Bayer Group	Bayer Group excluding LANXESS	LANXESS*
Total CFC-11 equivalent	38.3	41.1	33.95	19.41	14.54

*LANXESS data were not subject to the assurance process

Further emissions into the air

The following section deals with a number of “conventional” emissions, some of which arise as a result of incineration processes. Some of our production processes also release sulfur dioxide (SO₂) and nitrogen oxides (NO_x). Particulates occur in combustion installations used for energy generation as well as in production processes when, for example, pneumatic conveyors are used to transport solid granules.

Other emissions into the air

in 1,000 t/a	1998	2000	2002	2003	2004		
					Bayer Group	Bayer Group excl. LANXESS	LANXESS*
CO	9.3	3.8	3**	3.0	2.3	1.9	0.4
NO _x	12.2	11.2	9.4	6.7	6.3	4.3	2.0
SO ₂	7.7	6.6	7.4	5.9	5.6	4.2	1.4
Particulates	1.3	1.9	0.8	0.9	0.8	0.5	0.3

* LANXESS data were not subject to the assurance process

** not including ACS sites

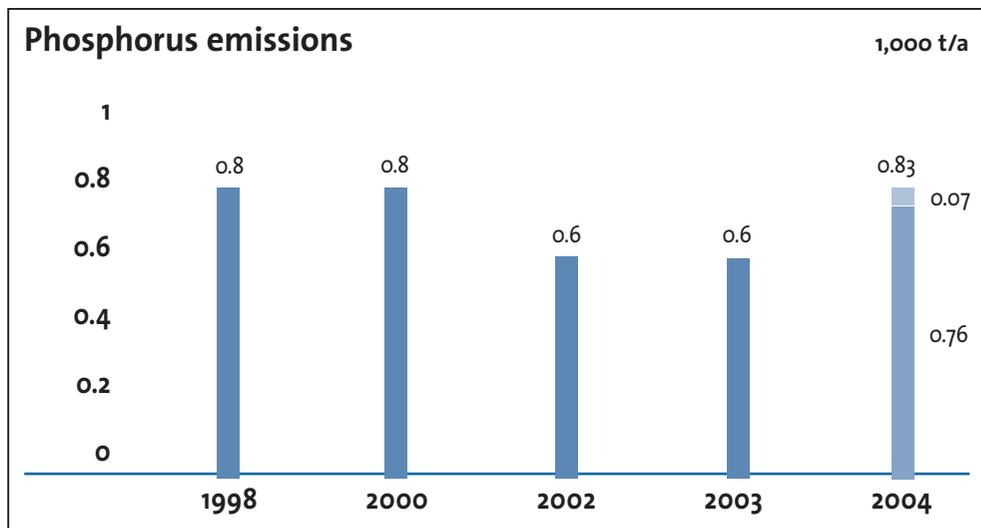
Compared to 2003 these emissions could be reduced further. The reduction of NO_x emissions can be attributed to a large part to measures for NO_x reduction at the Crop Science site in Institute, USA.

Emissions into water

Key performance indicator – Total phosphorus

Indicated here is the ingress of phosphates into surface water determined as phosphorus.

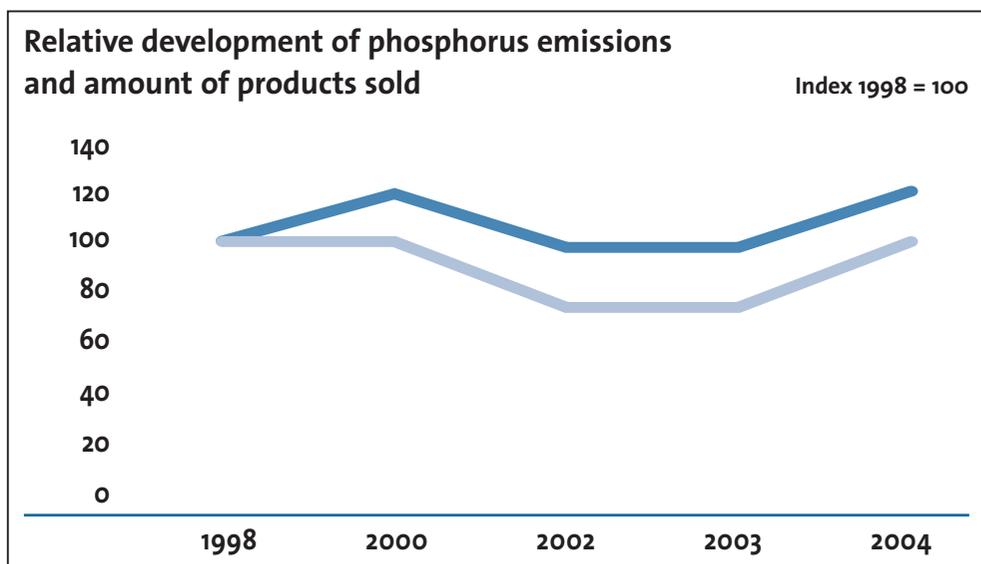
When comparing 2003 and 2004, an increase in phosphorus emissions can be seen. This can be explained by improvements in data recording. Despite major changes to the product portfolio, the quantity of phosphorus in wastewater remained approximately constant from 1998 to 2004.



- Bayer Group pre-2004
- Bayer Group excluding LANXESS
- LANXESS*

*LANXESS data were not subject to the assurance process

A comparison with the volume of products sold index shows that specific phosphorus emissions per ton of manufactured product fell between 1998 and 2004.



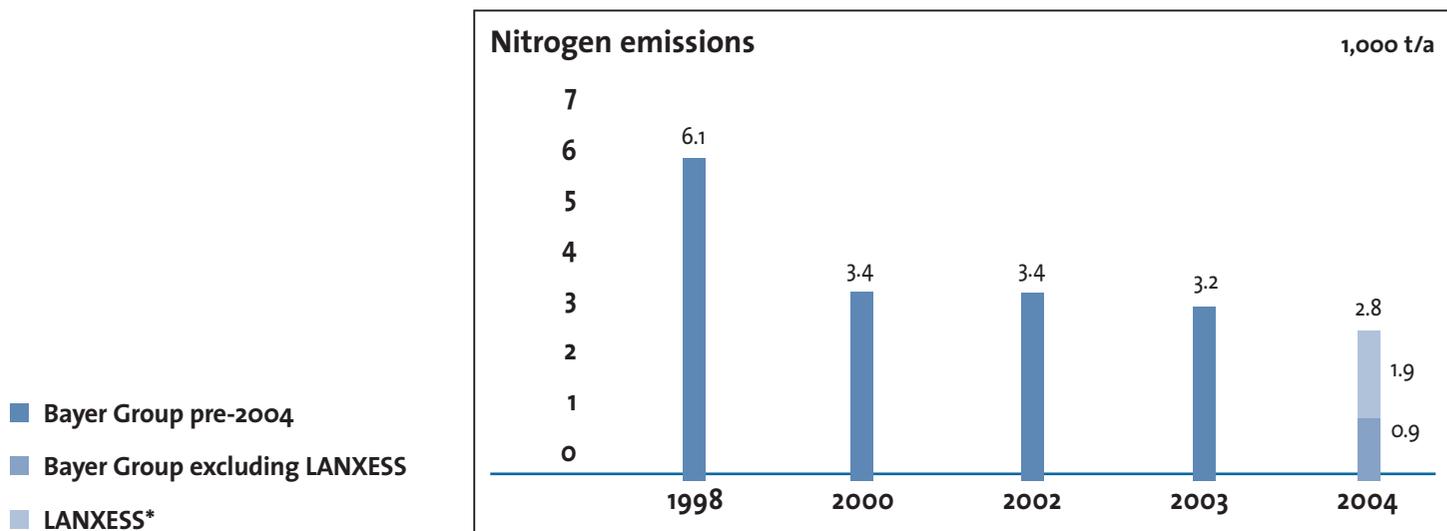
- Products sold
- Phosphorus total

Key performance indicator – Total nitrogen

Indicated is the ingress of nitrates and ammonium nitrogen into surface water determined as nitrogen.

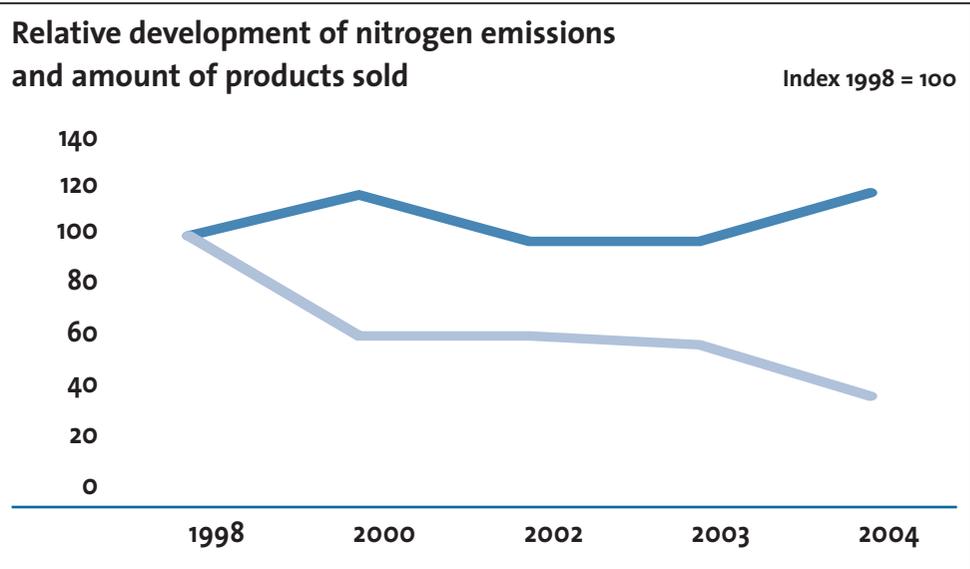
Compared to the previous year, emissions of nitrogen into wastewater were reduced considerably from 3,200 metric tons to 2,800 metric tons. In the case of this parameter, improvements to data quality have made their presence felt.

When compared over a longer period, this parameter was reduced by 54 % between 1998 and 2004. “End-of-pipe” measures such as the commissioning of a second nitrification/denitrification stage in the wastewater treatment plant at the Leverkusen Chemical Park have been influential here.



*LANXESS data were not subject to the assurance process

While nitrogen emissions were significantly reduced, the volume of products sold rose during the same period. Thanks to measures to improve wastewater treatment, it was possible to break the established link between an increased volume of products sold and a corresponding increase in the emission of nitrogen compounds.



- Products sold
- Nitrogen total

Further emissions into water

In this section, details are given of a number of parameters that are of additional interest, but were not included in the list of key performance indicators. The parameter total organic carbon (TOC) is representative of the pollution of wastewater with organic compounds and replaced the previous parameter COD (chemical oxygen demand) in 2003 as it is easier to determine.

Further emissions into water

	1998	2000	2002	2003	2004		
					Bayer Group	Bayer Group excl. LANXESS	LANXESS*
COD, 1,000 t/a	48	32	18	-	-	-	-
TOC, 1,000 t/a	-	-	-	6.4	5.51	2.37	3.14
Heavy metals, t/a	32	42	30	29	28.2	14.5	13.7
Inorganic salts, million t/a	1.4	2.0	1.5	1.6	-	1.0	Not recorded

*LANXESS data were not subject to the assurance process

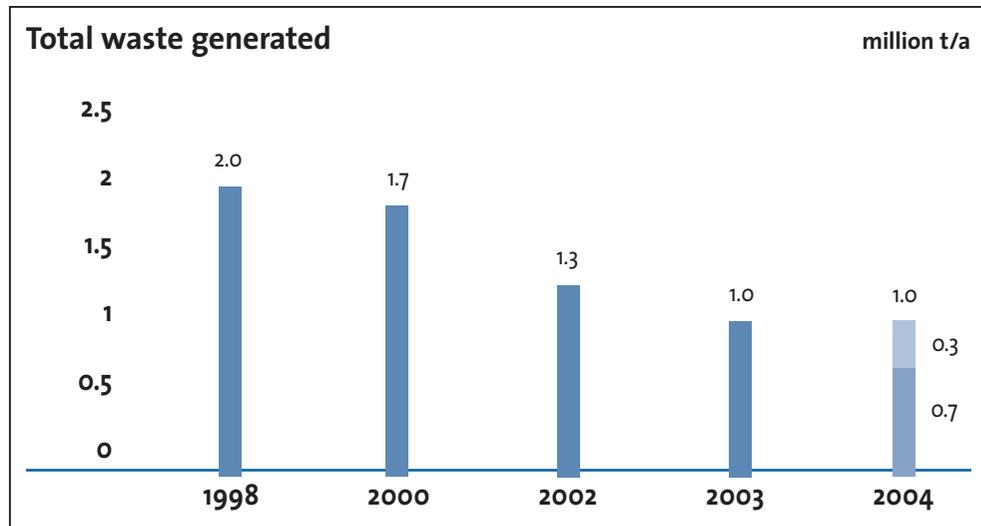
The TOC decreased over the year 2004 which can be explained by improved data collection. The remaining parameters are the total of all heavy metals and the total inorganic salts in wastewater. Whereas heavy metals decreased, the figure for inorganic salts 2004 cannot be compared to the previous reporting period since it does not cover the whole group (LANXESS did not record this parameter).

Waste volumen

Total waste generated

Waste generation in 2004 remained constant compared to 2003. The quantity of total waste generated, however, has been halved since 1998. This could be achieved by the continual improvement of our production processes, the use of selected raw materials as well by opting for high-quality long-living products. Other reasons for the decrease are the divestment of EC Erdölchemie GmbH as well as a relatively big share of construction wastes and excavated earth in the previously reported amounts not generated in 2004 to the same extent.

- Bayer Group pre-2004
- Bayer Group excluding LANXESS
- LANXESS*

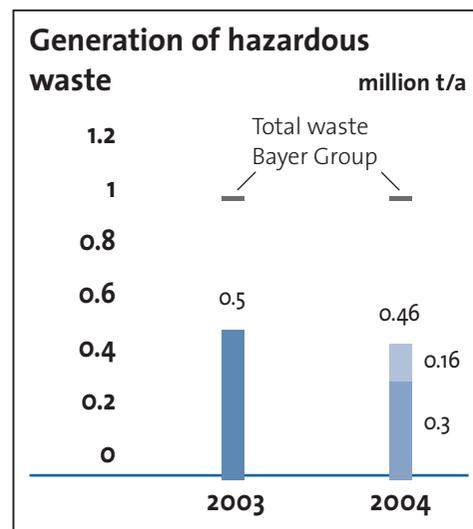


*LANXESS data were not subject to the assurance process

Key performance indicator – Generation of hazardous waste

According to national legislation, hazardous waste is distinguished from non-hazardous waste. In the case of Germany, for example, this means hazardous waste defined under the German Hazardous Substances Regulations as highly toxic, toxic or harmful to the environment, such as sludge from the company's own wastewater treatment plant, distillation residues or solvent residues.

When compared to the figure first reported in 2003, the quantity of hazardous waste was reduced from 0.5 to 0.46 million metric tons. The proportion of hazardous waste in relation to the total waste volume also went down from 50 % to 46 %.



- Bayer Group pre-2004
- Bayer Group excluding LANXESS
- LANXESS*

*LANXESS data were not subject to the assurance process

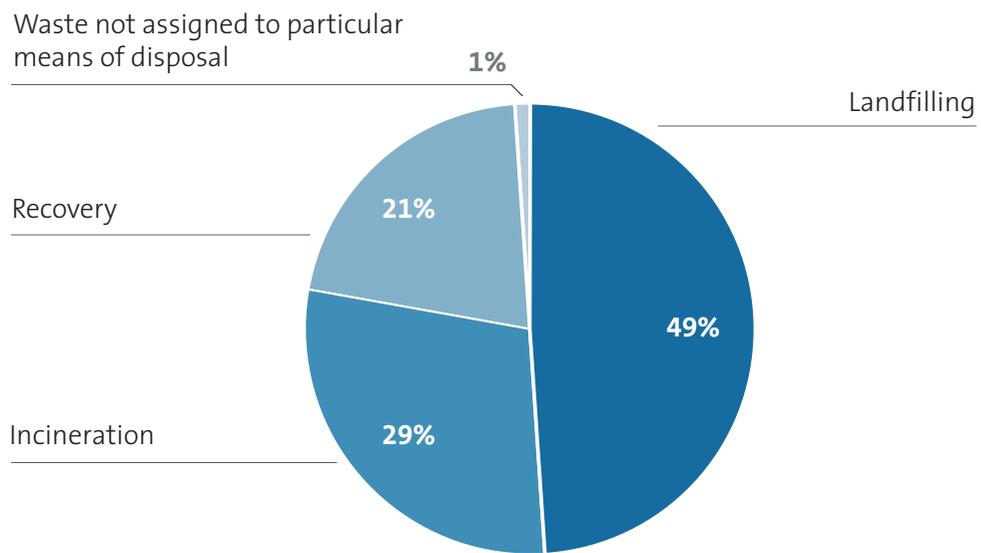
Waste disposal

This section contains details of the subdivision of waste according to the means of disposal. These figures relate solely to the new Bayer Group, after the carve-out of LANXESS.

The total quantity of 680,000 metric tons of waste was disposed of as follows by landfilling, recycling or incineration respectively. A very small quantity remains for which the information on the disposal channel chosen could not be determined during the data collection. However, proper disposal also of this small amount is safeguarded.

Waste disposal

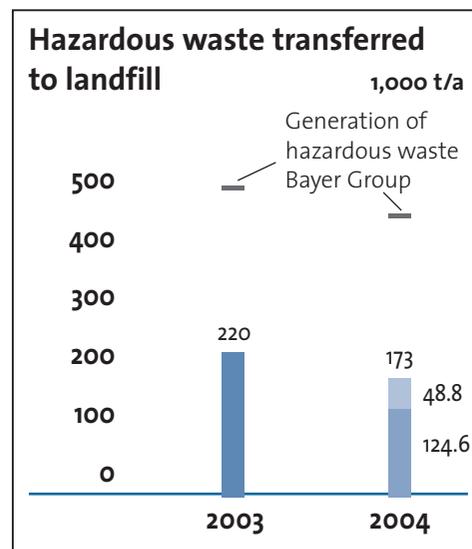
Total: 680,000 t



Key performance indicator – Hazardous waste transferred to landfill

Waste is reported in this category as distinguished from non-hazardous waste in accordance with national legislation.

For the second time since 2003, we have indicated the quantity of waste transferred to a landfill. The quantity has decreased by approximately 21 per cent. Its proportion of total hazardous waste produced was 38 %.



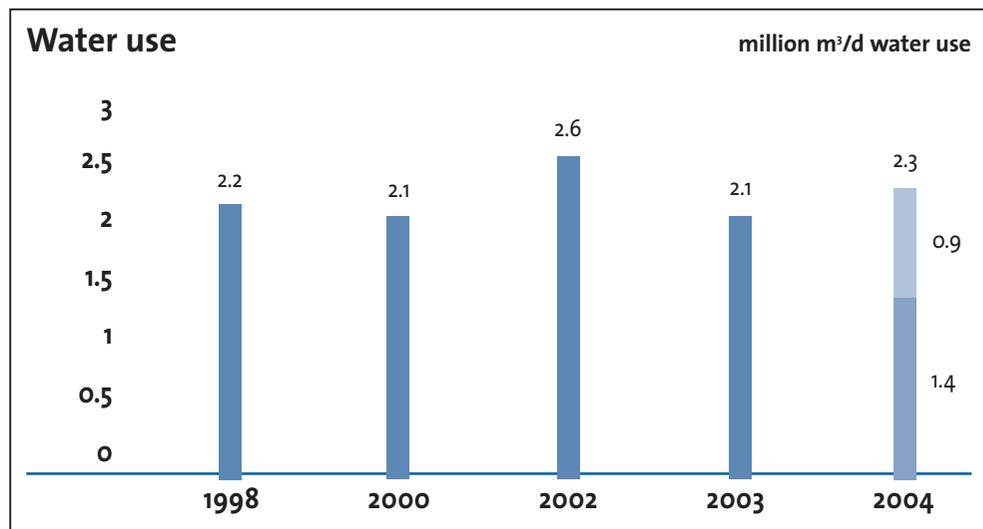
*LANXESS data were not subject to the assurance process

Key performance indicator – Water use

Reported here is the total water use of all sites, including cooling water.

2004 saw a slight rise in the volume of water consumed. Of the 1.4 million m³/d used (Bayer Group excluding LANXESS), almost 0.7 million m³/d were used as once-through cooling water, that is cooling water that was withdrawn from a watercourse, warmed up while being used for cooling and then finally returned to the same watercourse, without any further treatment.

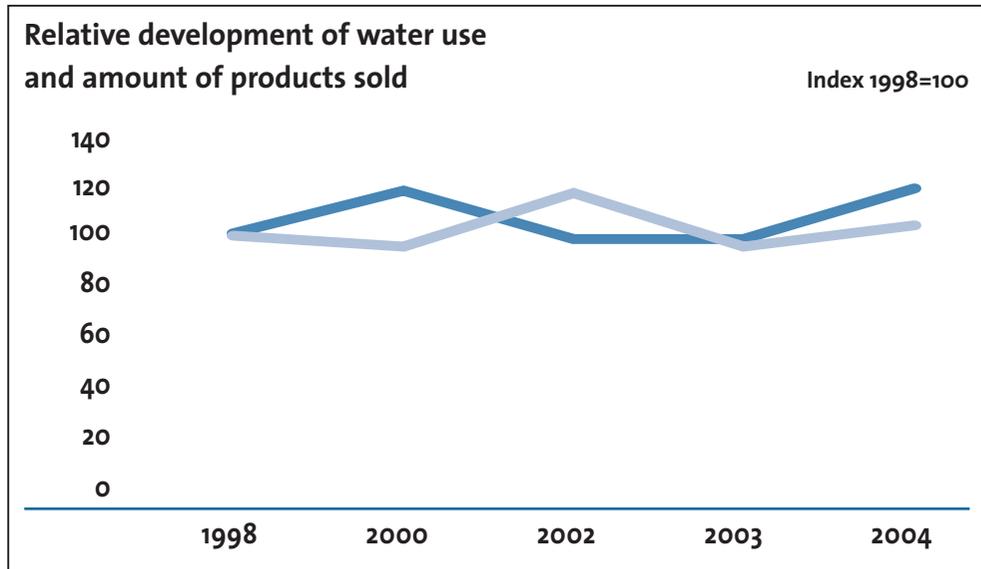
Water use has remained more or less constant since 1998. The rise between 2000 and 2002 from 2.1 million m³/d to 2.6 million m³/d can be attributed to the acquisition of Aventis Crop Science.



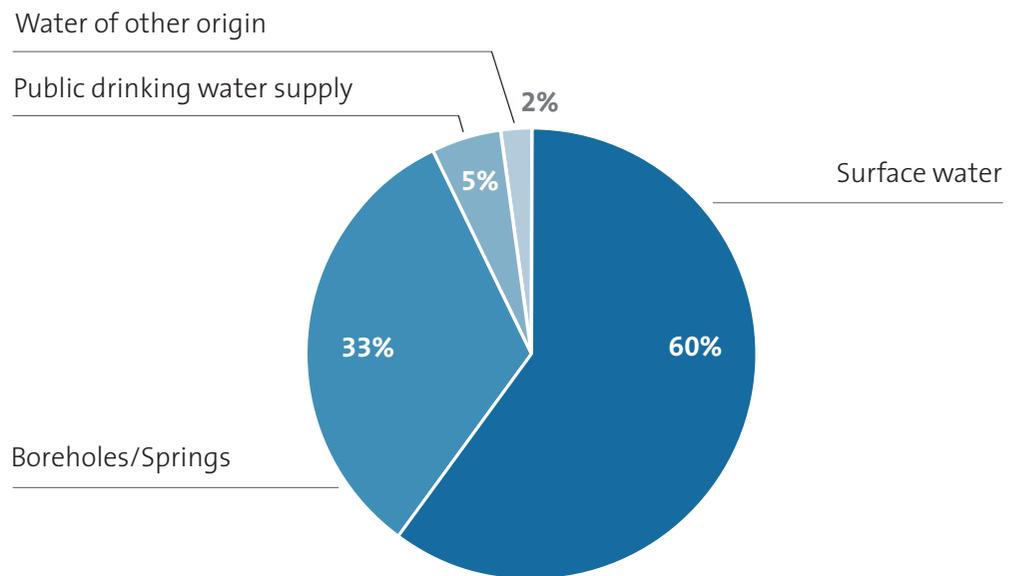
- Bayer Group pre-2004
- Bayer Group excluding LANXESS
- LANXESS*

*LANXESS data were not subject to the assurance process

Compared to the volume of products sold index, no clear trend can be ascertained.



The 1.4 million m³/d of water used by the Bayer Group, not including LANXESS (no figures are available for LANXESS), were taken from the following sources in 2004:

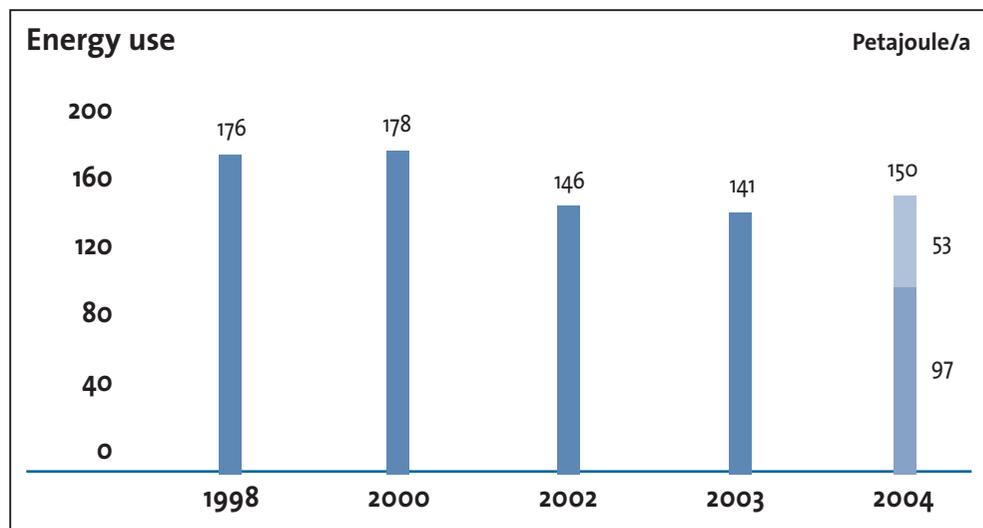


Key performance indicator – Energy use

Covered by this indicator is the use of all energy sources, including waste that is used for energy-generating purposes.

Compared to the previous year, energy use rose slightly during 2004 from 141 to 150 petajoules (10¹⁵ joule).

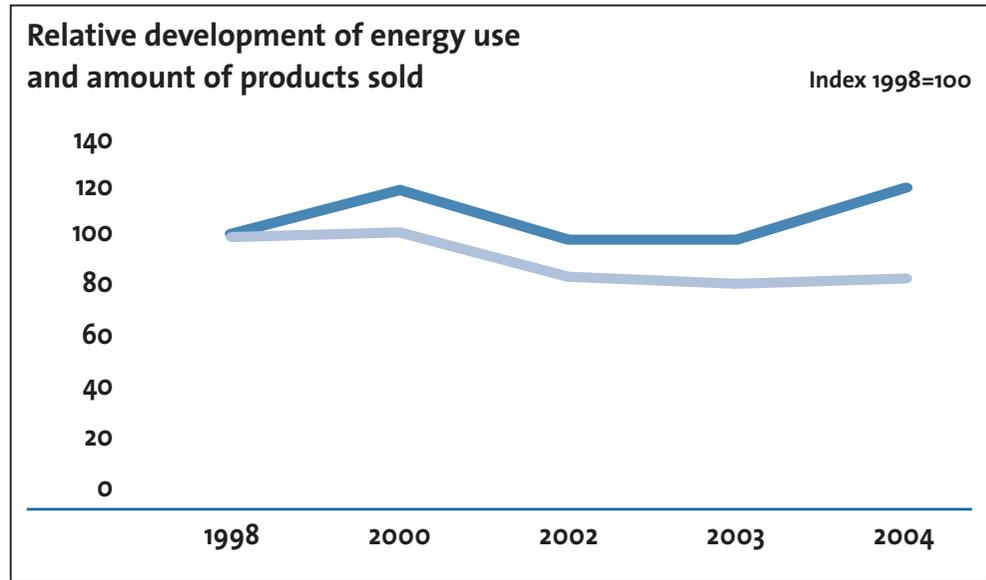
From 1998 to 2004, energy use was reduced from 176 petajoules to 150 petajoules. This is equivalent to a reduction of approximately 15 %.



- Bayer Group pre-2004
- Bayer Group excluding LANXESS
- LANXESS*

*LANXESS data were not subject to the assurance process

A comparison with the volume of products sold index shows that the rise in energy consumption was clearly and inversely proportional to the rise in volume of products sold during the same period.



Bayer's sustainability reporting has evolved from its environmental reporting over recent years. The performance indicators given here therefore relate to the key aspects of health, safety and environmental protection, as part of the overall sustainability reporting.

We take considerable care to ensure that we comply as closely as possible to the GRI Guidelines. In order to indicate the specific GRI performance indicators to which each statement relates, we attach the following index to our HSE performance report:

GRI reference	Ecological performance indicators	Bayer indicator
EN3	Direct energy consumption	KPI Energy use p. 30
EN5	Total water consumption	KPI Water use p. 28
EN8-10	Emissions into the air: Greenhouse gases, ozone-depleting substances, other significant emissions	KPI Direct emissions of greenhouses gases p. 15; Emissions with ozone depletion potential p.18; Further emissions into the air p. 19
EN11	Total volume of waste	Waste volumes p. 24
EN12	Significant emissions into water	KPI Total phosphorus p. 20; KPI Total nitrogen p. 21; Further emissions into water p. 23
EN13	Environmental incidents	KPI Major environmental incidents p. 13
GRI reference	Corporate performance indicators	Bayer indicator
LA1	Personnel statistics	Employees p. 6
LA7	Injuries and occupational accidents	KPI Industrial injuries leading to days of absence p. 9; KPI Reportable industrial injuries p. 10; Industrial injuries to contractor employees leading to days of absence p. 11; Industrial injuries with fatal outcome p.12