

Indicators

We use indicators to measure and assess our corporate responsibility performance. The following key figures have undergone a limited assurance by KPMG AG Wirtschaftsprüfungsgesellschaft. Sigma-Aldrich became part of the Merck Group in November 18, 2015. Because of the integration process currently underway, we have specified under each of the following tables whether the figures presented include or exclude Sigma-Aldrich.

Indicators: Economics

Net sales, operating result (EBIT) and research and development costs, by business sector (€ million)¹

	Healthcare	Life Science	Performance Materials	Group ²
2014				
Net sales ³	6,620.5	2,682.5	2,059.8	11,362.8
Operating result (EBIT)	1,106.4	289.2	611.5	1,762.0
R&D costs	1,366.0	162.6	170.6	1,703.7
2015 ⁴				
Net sales ³	6,933.8	3,355.3	2,555.6	12,844.7
Operating result (EBIT)	1,096.7	300.8	878.0	1,843.2
R&D costs	1,310.1	197.5	197.0	1,709.2

1 On January 1, 2015, the Merck Group changed its segment reporting structure to report on the three segments Healthcare, Life Science and Performance Materials.

2 As a non-operating segment, Corporate and Other is not shown here (see Annual Report 2015, Segment Reporting).

3 The composition of net sales has been changed, see "Changes to accounting and measurement principles and disclosure changes" in the Notes to the Group Accounts.

4 Merck including Sigma-Aldrich.

Indicators: Compliance

Internal audits on corruption and Human Rights Charter

	2012	2013	2014	2015 ¹
Number of audits relating to corruption	40	30	36	49
% of audits relating to corruption	not recorded	64	68	64
Number of audits relating to the workplace section of the Merck Human Rights Charter	40	27	32	41

1 The figures exclude Sigma-Aldrich since the integration process is still underway.

Compliance violations reported via the SpeakUp Line

	2012	2013	2014	2015 ¹
Number of reported compliance incidents	20	22	26	33
Number of confirmed cases	5	9	11	8

1 The figures exclude Sigma-Aldrich since the integration process is still underway.

Compliance training

	2012	2013	2014 ¹	2015 ²
Total number of persons trained on anti-corruption guidelines	22,890	24,168	7,519³	20,404³
% of employees trained on anti-corruption	59	63	14	43
Number of employees Global Grade 10 or higher trained on anti-corruption	10,164	12,390	3,071	12,747
% of employees Global Grade 10 or higher trained on anti-corruption	60	69	17	64
% of employees Global Grade 9 or lower trained on anti-corruption	58	51	12	22

1 In Q1 – Q3 2014, Group Compliance performed a thorough analysis and review of its Compliance Training Program. No courses were scheduled for these quarters.

2 The figures exclude Sigma-Aldrich since the integration process is still underway.

3 Includes contractors, external supervised workers (e.g. temps) and contract partners working on-site who were trained on anti-corruption guidelines (2014: 2,023, 2015: 3,026).

In order to address the special responsibility held by management personnel, as well as by staff with HR responsibility, these employees are increasingly receiving training on anti-corruption guidelines. This applies to all employees rated Global Grade (GG) 10 or higher.

To date, we have not differentiated between regions when recording compliance training; we are planning to do so in the future. Our compliance and anti-corruption principles are communicated to all our business partners, who undergo a Business Partner Risk Management (BPRM) process.

Legal actions

	2012	2013	2014	2015 ¹
Total number² of legal actions pending or completed (for anti-competitive behavior, violations of anti-trust or violations of monopoly legislation)	3	3	2	2
pending	2	2	2	2
completed	1	1	0	0

1 Merck including Sigma-Aldrich.

2 As published in the annual reports, the herein listed total number of legal actions refers to the significant legal risks as per the company's definition. The significance of legal risks is based on potential negative effects on projected financial objectives as well as on the probability of occurrence.

For further information please see our annual reports:

- [Annual Report 2012](#), page 88 and pages 168-169, no. 50
- [Annual Report 2013](#), pages 132-134 and pages 226-227, no. 48
- [Annual Report 2014](#), pages 130-131 and pages 213-215, no. 48
- [Annual Report 2015](#), pages 128-129 and pages 212-213, no. 27

Indicators: products

Customer privacy

	2012	2013	2014	2015 ¹
Total number of substantiated complaints received from outside parties	not recorded	0	0	0
Total number of complaints from regulatory bodies	not recorded	0	1	0
Total number of identified leaks, thefts, or losses of customer data	not recorded	0	0	0

1 The figures exclude Sigma-Aldrich since the integration process is still underway.

A corporate directive regulates data protection within the Merck Group. We have received no significant complaints from customers, regulatory bodies or outside parties.

Indicators: Employees

Total number of employees

As of Dec. 31	2013	2014	2015 (Merck excl. Sigma-Aldrich)	2015 (Merck incl. Sigma-Aldrich)
Total number of employees	38,154	39,639	40,718	49,613
Men	22,253	23,273	23,891	28,997
Women	15,901	16,366	16,827	20,616

Number of employees by hierarchical level

As of Dec. 31	2013	2014 ¹	2015 (Merck excl. Sigma-Aldrich)	2015 (Merck incl. Sigma-Aldrich)
Total employees	38,154	39,639	40,718	49,613
Senior management (Global Grade above 17)	63	63	75	– ²
Low and middle management (Global Grade 14–17)	1,949	2,108	2,333	– ²
Other employees (Global Grade below 14)	36,142	37,468	38,310	– ²
% of women (total)	42	41	41	42
thereof in senior management (Global Grade above 17)	10	10	12	– ²
thereof in low and middle management (Global Grade 14–17)	498	562	633	– ²
thereof other employees (Global Grade below 14)	15,393	15,794	16,182	– ²
% of men (total)	58	59	59	58
thereof in senior management (Global Grade above 17)	53	53	63	– ²
thereof in low and middle management (Global Grade 14–17)	1,451	1,546	1,700	– ²
thereof other employees (Global Grade below 14)	20,748	21,673	22,128	– ²
by age group				
Up to 29 years old (%)	15	15	15	15
thereof in senior management (Global Grade above 17)	0	0	0	– ²
thereof in low and middle management (Global Grade 14–17)	5	6	5	– ²
thereof other employees (Global Grade below 14)	5,901	5,884	5,848	– ²
30 to 49 years old (%)	64	64	64	63
thereof in senior management (Global Grade above 17)	27	24	29	– ²
thereof in low and middle management (Global Grade 14–17)	1,233	1,340	1,469	– ²
thereof other employees (Global Grade below 14)	23,302	24,082	24,680	– ²
50 years or older (%)	20	21	21	22
thereof in senior management (Global Grade above 17)	36	39	46	– ²
thereof in low and middle management (Global Grade 14–17)	711	762	859	– ²
thereof other employees (Global Grade below 14)	6,939	7,502	7,782	– ²

1 Figures do not include the employees of AZ Electronic Materials, a company acquired in July 2014, because our Global Grading System had not yet been implemented for them as of December 31, 2014. These employees are included under "thereof other employees (Global Grade below 14)".

2 The Global Grading System has not yet been implemented for employees of Sigma-Aldrich, a company acquired in November 2015. It is not possible to provide figures for them.

Average number of employees by functional area

Average number of employees	2013 ¹	2014 ¹	2015 (Merck excl. Sigma- Aldrich) ²	2015 (Merck incl. Sigma- Aldrich) ²
Group	38,282	38,930	40,147	41,511
Thereof women	not recorded	16,110	16,600	17,180
Production	9,985	10,176	11,122	11,563
Thereof women	not recorded	3,202	3,494	3,642
Logistics	1,779	2,207	2,345	2,581
Thereof women	not recorded	774	829	913
Marketing and Sales	12,214	12,113	12,553	12,871
Thereof women	not recorded	4,814	5,022	5,204
Administration	5,106	6,342	6,550	6,763
Thereof women	not recorded	3,557	3,664	3,757
Research and Development	4,433	4,738	4,954	5,097
Thereof women	not recorded	2,534	2,605	2,674
Infrastructure and Other	4,765	3,354	2,623	2,636
Thereof women	not recorded	1,230	986	990

1 Average Head Count (HC) 2014 and 2013 is calculated based on the End HC of the last 5 quarters divided by 5.

2 The average employee headcount for 2015 is calculated by adding up all employees at the end of each of the last 13 months (Dec. 31, 2014-Dec. 31, 2015), and dividing this total by 13. Employees of Sigma-Aldrich, a company acquired in November 2015, are only included in the employee headcount calculations as of November 2015.

Number of employees by region¹

As of Dec. 31	2013	2014	2015 (Merck excl. Sigma-Aldrich)	2015 (Merck incl. Sigma-Aldrich)
Total	38,154	39,639	40,718	49,613
Employees in Europe	20,013	20,537	20,950	23,429
thereof women	8,755	8,893	9,114	10,316
Employees in North America	4,911	5,092	5,172	9,794
thereof women	2,246	2,272	2,290	4,183
Employees in Asia-Pacific (APAC)	8,862	9,488	9,839	11,096
thereof women	2,947	3,176	3,282	3,706
Employees in Latin America	3,798	3,883	4,032	4,352
thereof women	1,699	1,745	1,824	1,986
Employees in the Middle East and Africa (MEA)	570	639	725	942
thereof women	254	280	317	425

1 As regards segment reporting by country and region, the composition of regions was adjusted and the corresponding comparative year-earlier figures are presented. The regional reporting structure now comprises five regions: Europe, North America, Asia-Pacific, Latin America as well as Middle East and Africa.

Contractors such as temps are currently not logged in our employee data system. We are investigating possibilities for recording this information.

Employees by business sector¹

As of Dec. 31	2013	2014	2015 (Merck excl. Sigma-Aldrich)	2015 (Merck incl. Sigma-Aldrich)
Healthcare employees	17,278	17,757	18,566	18,566
Thereof women	7,909	8,130	8,522	8,522
Thereof women (%)	46	46	46	46
Life Science employees	9,837	9,796	9,716	18,611
Thereof women	4,124	4,134	4,094	7,883
Thereof women (%)	42	42	42	42
Performance Materials employees	4,709	5,995	6,228	6,228
Thereof women	1,210	1,498	1,531	1,531
Thereof women (%)	26	25	25	25

¹ On January 1, 2015, the Merck Group changed its segment reporting structure to report on the three segments Healthcare, Life Science and Performance Materials. The corresponding figures from the preceeding years have been retroactively adjusted.

Employees by contract type

As of Dec. 31	2013	2014	2015 (Merck excl. Sigma-Aldrich)	2015 (Merck incl. Sigma-Aldrich)
Total employees	38,154	39,639	40,718	49,613
Number of employees with permanent contracts	36,908	38,410	37,690	46,454
Number of employees with temporary contracts	1,246	1,219	3,028	3,159
% of employees with permanent contracts	97	97	93	94
% of employees with temporary contracts	3	3	7	6
full-time employees	34,911	37,573	38,627	47,292
% full-time	95	98	95	95
thereof women	13,524	14,497	14,963	18,557
thereof women (%)	39	39	39	39
part-time employees	1,994	2,066	2,091	2,321
% part-time	6	5	5	5
thereof women	1,839	1,869	1,864	2,059
thereof women (%)	92	90	89	89

New employees

	2013	2014	2015 ¹
Total number of new employee hires	5,007	6,212	5,710
by age group			
Up to 29 years old	2,358	2,305	2,088
30 to 49 years old	2,397	3,361	3,252
50 or older	252	546	370
by gender			
Women	2,051	2,513	2,450
Men	2,945	3,689	3,260
by region			
Europe	1,757	2,312	2,119
North America	526	826	730
Asia-Pacific (APAC)	2,060	2,298	1,913
Latin America	548	619	780
Middle East and Africa (MEA)	116	157	168
Rate of new employee hires² (%)	13	16	14
by age group³			
Up to 29 years old	47	37	37
30 to 49 years old	48	54	57
50 or older	5	9	6
by gender³			
Women	41	41	43
Men	59	59	57
by region³			
Europe	35	37	37
North America	11	13	13
Asia-Pacific (APAC)	41	37	33
Latin America	11	10	14
Middle East and Africa (MEA)	2	3	3

1 These figures exclude the 8,975 Sigma-Aldrich employees, who are not classified as new hires because they joined Merck as part of the Sigma-Aldrich acquisition.

2 Formula for calculating the rate of new employee hires: Total number of new employee hires divided by Number of employees at the end of the fiscal year.

3 Formula for calculating the rate of new employee hires by age/gender/region: New employee hires of the focus group divided by the total number of new employee hires. In consequence of the modified calculation method and the new composition of our regions effective January 1, 2015 corresponding figures for the preceeding years have been retroactively adjusted.

Staff turnover¹

	2013 ²	2014 ²	2015 ³
Total turnover rate	14.61	11.01	10.38
Turnover rate by gender			
Men	13.98	10.75	10.13
Women	15.00	11.38	10.73
Turnover rate by age group			
Up to 29 years old	21.55	18.71	17.49
30 to 49 years old	13.44	9.72	9.69
50 or older	13.01	9.49	8.08
Turnover rate by region			
Europe	14.61	7.05	6.22
North America	10.51	12.45	12.72
Asia-Pacific (APAC) ⁴	not recorded	17.55	15.95
Latin America ⁴	not recorded	13.67	15.29
Middle East and Africa (MEA) ⁴	not recorded	13.62	12.00
Total number of leavers	5,573	4,364	4,168
by gender			
Men	3,110	2,502	2,386
Women	2,385	1,862	1,782
by age group			
Up to 29 years old	1,273	1,102	943
30 to 49 years old	3,300	2,474	2,505
50 or older	1,000	788	720
by region			
Europe	2,367	1,447	1,290
North America	516	634	638
Asia-Pacific (APAC) ⁴	not recorded	1,665	1,540
Latin America ⁴	not recorded	531	618
Middle East and Africa (MEA) ⁴	not recorded	87	82

1 The table contains unadjusted turnover rates. The rate excludes employees who depart due to parental leave or a long-term illness, as well as employees who are transitioning to the non-working phase of partial retirement.

2 Employee turnover for fiscal 2013 and 2014 is calculated as follows: Total number of leavers of the past 12 months multiplied by 100 divided by the employee headcount as of December 31.

3 Employee headcount for fiscal 2015 is calculated as follows: Total number of leavers from the past 12 months divided by the average employee headcount of the past 12 months multiplied by 100. These figures exclude Sigma-Aldrich since it is still undergoing the integration process. In consequence of the modified calculation method for turnover rate, it is only possible to make a limited statement concerning interannual trends.

4 We have no 2013 data for the Asia-Pacific (APAC), Latin America, and Middle East and Africa (MEA) regions, which were realigned in 2015.

Core labor standards of the International Labour Organization (ILO)

As of Dec. 31	2013	2014	2015 ¹
% of full-time employees (standard contract, excluding exempts) with contractually stipulated working hours of maximally 48 hours/week ²	99	99	100
% of full-time employees (standard contract) with at least 15 vacation days/year ³	98	95	97
% of female employees with access to maternity leave programs ⁴	100	100	100
% of employees with the right to collective bargaining ⁵	97	97	98
% of employees working at companies where collective agreements apply	68	66	71
% of sites that rule out complicity in child labor as described in ILO Convention 138	100	100	100
Age of youngest employees, excluding apprentices	16	17	17

1 The figures exclude Sigma-Aldrich since the integration process is still underway.

2 ILO: Hours of Work (Commerce and Offices) Convention, 1930 (No. 30).

3 ILO: Holidays with Pay Convention (Revised), 1970 (No. 132).

4 ILO: Maternity Protection Convention (Revised), 1952 (No. 103).

5 ILO: Freedom of Association and Protection of the Right to Organise Convention, 1948 (No. 87).

Local minimum wage

As of Dec. 31	2013	2014	2015 ¹
% of sites that guarantee a salary above the local minimum wage ²	100	100	100

1 The figure does not include data from Sigma-Aldrich since the integration process is still underway.

2 Minimum wage as stipulated by law, or derived from other provisions such as collective agreements.

The Global Rewards Policy applies across all Merck subsidiaries worldwide and guarantees a systematic compensation structure. Base pay is oriented to the median base pay, and short-term variable compensation is based on the third quartile of the relevant reference market. The overall compensation package thus exceeds the market median.

Work-related accidents¹

	2013	2014	2015 ²
Lost Time Injury Rate (LTIR=workplace accidents resulting in missed days of work per one million man-hours)	2.2	1.8	1.5
by region			
Europe	3.7	2.9	2.7
North America	0.9	1.0	0.8
Asia-Pacific (APAC)	0.3	0.5	0.2
Latin America	2.1	1.3	0.5
Middle East and Africa (MEA)	1.8	0.9	0.0
Number of deaths	0	2	2
by region			
Europe	0	0	1
North America	0	0	1
Asia-Pacific (APAC)	0	1	0
Latin America	0	1	0
Middle East and Africa (MEA)	0	0	0
by gender			
Women	0	1	1
Men	0	1	1

1 Including contractors.

2 The figures exclude Sigma-Aldrich since the integration process is still underway.

Despite our efforts at accident prevention, we've had four fatal workplace accidents over the last two years. In 2015, one employee died in a car accident in the USA, and in Germany one employee suffered a fatal accident involving a fork lift. In 2014, an employee died in Venezuela in a traffic accident, and in Pakistan an employee suffered a fatal incident doing maintenance work on a scissor lift.

Both Merck employees as well as contractors have been included in the calculation of these indicators.

Through the LTIR, we record work-related accidents that involve at least one day of missed work. A work-related accident is an injury that results from the type of work, in the course of doing said work, and that has no internal cause (cumulative trauma). Work-related accidents are considered relevant if they occur on the premises, on business trips, during goods transport, as a result of external influences (e.g. natural disasters), or due to criminal acts involving personal injury. Commuting accidents and accidents during company sporting activities are not included. First-aid incidents are generally not included in the LTIR since these usually do not result in more than one day of missed work.

By 2020, we intend to sustainably lower the LTIR to 1.5. The aim is to permanently stabilize or outperform this challenging number, which we achieved for the first time in 2015.

For the Merck KGaA sites in Darmstadt and Gernsheim (about 19% of the employees of the Merck Group) we only report work-related illnesses if these have been diagnosed and verified by a physician. In the reporting period, no cases of work-induced illness were recorded.

We have defined the LTIR as a key indicator for the Merck Group. Therefore, we do not publish any other indicators such as workplace accidents, lost days or days of absence. The LTIR is not broken down by gender as this differentiation is not relevant to our strategic planning.

Spending on advanced training for employees (€)

	2013	2014	2015 ¹
Average continuing education spending per employee	679	718	775

1 The figure does not include data from Sigma-Aldrich since the integration process is still underway.

We record and report the costs of vocational training and continuing education for our employees. We are not currently tracking the average number of continuing education hours consolidated at Group level, but we are working on a technical solution to track all training hours globally.

Employees who regularly receive a performance and development evaluation

	2013 ¹	2014 ²	2015 ³
% of employees who receive a performance and development evaluation	72	79	88
by gender			
Women	75	84	90
Men	71	77	87
by employee category			
Senior management (Global Grade above 17)	100	97 ⁴	100
Low and middle management (Global Grade 14–17)	100	96 ⁴	100
Other employees (Global Grade below 14)	72	78 ⁴	88

1 The 2013 data is based on a reporting date of March 12, 2014.

2 The 2014 data is based on a reporting date of March 2, 2015.

3 The 2015 data is based on a reporting date of February 29, 2016. The figures exclude Sigma-Aldrich since the integration process is still underway.

4 The fluctuations in participant numbers by employee category can be explained by the process of the Merck's acquisition of AZ Electronic Materials.

Regular feedback and employee performance evaluations are essential to a systematic development process. Our globally uniform Performance and Talent Management Process requires annual feedback meetings and performance assessments for all employees rated Global Grade 10 and up in our position grading system. Apart from evaluating employee performance, this helps us to identify individual development opportunities. The Performance and Talent Management Process is coordinated via the HR Suite IT system.

When it comes to applying this process, our individual subsidiaries can decide for themselves whether to include employees rated below Global Grade 10. In Germany, all permanent employees have been participating in the Performance and Talent Management Process since 2013. In 2015, around 36,017 employees worldwide were involved in the process.

Apprentices

As of Dec. 31	2013	2014 ¹	2015 ²
Number of apprentices	516	498	506
% of apprentices	5.6	5.4	5.3

1 Only pertains to Merck KGaA sites in Darmstadt, Gernsheim and Grafing, Germany (which accounted for roughly 24% of the Merck Group's employees in 2014).

2 Only pertains to Merck KGaA (roughly 19% of the Merck Group's total employee headcount in 2015)

Internationality of employees

As of Dec. 31	2013	2014 ¹	2015 ²
Number of nationalities	114	122	122
Number of nationalities in management positions (Global Grade 14 or above)	64	67	64
% of non-Germans in management positions (Global Grade 14 or above)	60	60	61

1 These figures do not include the employees of AZ Electronic Materials, a company that was acquired in July 2014. As of December 31, 2014, the Global Grading System had not yet been implemented there.

2 The figures do not include data from Sigma-Aldrich since the integration process is still underway.

Employee age by region

As of Dec. 31

Number of employees	Worldwide	North America	Europe (including Germany)	Germany	Asia-Pacific (APAC)	Latin America	Middle East and Africa (MEA)
2014							
Up to 29 years old	5,890	512	2,427	1,513	2,256	538	157
thereof women	2,458	221	1,105	579	778	295	59
30 to 49 years old	25,446	2,804	12,979	6,359	6,444	2,818	401
thereof women	10,854	1,302	5,862	2,486	2,224	1,283	183
50 or older	8,303	1,776	5,131	3,319	788	527	81
thereof women	3,054	749	1,926	1,133	174	167	38
Average age	40.6	44.5	42.0	42.7	36.1	39.2	37.2
Total employees	39,639	5,092	20,537	11,191	9,488	3,883	639

2015 (Merck excluding Sigma-Aldrich)

Up to 29 years old	5,853	529	2,497	1,544	2,121	539	167
thereof women	2,479	224	1,147	602	749	297	62
30 to 49 years old	26,178	2,790	13,149	6,421	6,841	2,929	469
thereof women	11,150	1,287	5,963	2,501	2,338	1,349	213
50 or older	8,687	1,853	5,304	3,357	877	564	89
thereof women	3,198	779	2,004	1,159	195	178	42
Average age	41.1	45.2	42.4	42.9	36.9	39.8	37.8
Total employees	40,718	5,172	20,950	11,322	9,839	4,032	725

2015 (Merck including Sigma-Aldrich)

Up to 29 years old	7,565	1,314	2,912	1,624	2,496	666	177
thereof women	3,233	522	1,378	649	898	367	68
30 to 49 years old	31,047	5,117	14,589	6,775	7,651	3,092	598
thereof women	13,242	2,285	6,673	2,674	2,576	1,434	274
50 or older	11,001	3,363	5,928	3,539	949	594	167
thereof women	4,141	1,376	2,265	1,241	232	185	83
Average age	41.2	44.2	42.4	43.0	36.7	39.5	39.5
Total employees	49,613	9,794	23,429	11,938	11,096	4,352	942

Insurance and pension systems for employees

In addition to having statutory accident insurance, more than 95% of our employees are covered by locally arranged company accident insurance.

We offer a company pension in numerous countries along with various programs for supplemental company pensions and survivor's benefits. Around two-thirds of our employees are enrolled in such a program.

In addition to this, in numerous countries we also offer supplementary health insurance for employees and family members, an option utilized by roughly two-thirds of our employees.

Long-term pension obligations and post-employment benefits

€ million	2013	2014	2015 ¹
Present value of all pension obligations as of Dec. 31	2,737	3,813	4,153
Pension expenses	147	157	210

1 Merck including Sigma-Aldrich.

Depending on the legal, economic and fiscal circumstances prevailing in each country, different retirement benefit systems are provided for the employees of the Merck Group. Generally these systems are based on the years of service and salaries of the employees. Pension obligations of the Merck Group include both defined benefit and defined contribution plans and comprise both obligations from current pensions and accrued benefits for pensions payable in the future. In the Merck Group, defined benefit plans are funded and unfunded. Provisions also contain other post-employment benefits, such as accrued future health care costs for retirees in the United States (see our Annual Report 2015, Note on Provisions for pensions and other post-employment benefits).

Flexible working hours

As of Dec. 31	2013	2014	2015 ¹
% of employees with the option of working flexible hours	75	74	80

1 The figure does not include data from Sigma-Aldrich since the integration process is still underway.

Indicators: Environment

Spending on environmental protection, safety and health (€ million)

	2012	2013	2014	2015 ¹
Spending	146	142	145 ²	148

1 The figure does not include data from Sigma-Aldrich since the integration process is still underway.

2 Figure retroactively adjusted.

These figures include both investments in as well as internal and external spending on waste and wastewater management, water, occupational safety, fire protection, noise reduction, air pollution prevention, decontamination, preservation of nature and the landscape, climate impact mitigation, and energy efficiency.

Total greenhouse gas emissions (metric kilotons) (Scope 1 and 2 of the GHG Protocol)¹

	2006 ²	2012	2013	2014	2015 ³
Total CO₂eq⁴ emissions	561	543	559	517	518
Thereof					
direct CO ₂ eq emissions	316	318	348	321	327
indirect CO ₂ eq emissions	245	225	211	196	191
Biogenic CO₂ emissions	6	5	6	11	54

1 In line with the Greenhouse Gas Protocol, for all previous years (up to the 2006 baseline) the greenhouse gas emissions have been calculated based on the current corporate structure of the reporting year and retroactively adjusted for acquisitions (e.g. AZ Group in 2014) or divestments of (parts of) companies, or for changes in emission factors (portfolio-adjusted).

2 Baseline for our emission targets is 2006.

3 This figure does not include data from Sigma-Aldrich since the integration process is still underway. The direct and indirect CO₂eq emissions (Scope 1 and 2) of the former Sigma-Aldrich sites add up to approximately 215 metric kilotons in 2015.

4 eq = equivalent

The increase in biogenic carbon emissions was caused by the biomass powerplants that were commissioned in Goa, India, and Jaffrey, New Hampshire (USA) at the end of 2014.

Our response to the Carbon Disclosure Project contains a detailed description of our calculation methods. We have included the following gases in our calculation of direct and indirect CO₂eq emissions:

- Direct CO₂ emissions: CO₂, HFCs, PFCs; CH₄/N₂O negligible; SF₆/NF₃ not available.
- Indirect CO₂ emissions: CO₂.

In 2015, we emitted 0.040 kg of CO₂eq per euro of net sales.

Other relevant indirect greenhouse gas emissions (Scope 3 of the GHG Protocol)

	2012	2013	2014	2015 ²
Total gross other indirect emissions (metric kilotons CO₂eq¹)	49	64	319	349
Fuel- and energy-related emissions, not included in Scope 1 or 2 (category 3)	not recorded	not recorded	97	95
Waste generated in operations (category 5)	not recorded	not recorded	96	123
Business travel - air travel (category 6)	48	63	74	79
Business travel - rail travel (category 6)	0.1	0.05	0.02	0.02
Business travel - rental car travel (category 6)	0.8	1.3	1.2	1.1
Employee commuting (category 7)	not recorded	not recorded	51	51
Upstream leased assets (category 8)	not recorded	not recorded	0 ³	0 ³
Processing of sold products (category 10)	not recorded	not recorded	0 ⁴	0 ⁴
Downstream leased assets (category 13)	not recorded	not recorded	0	0
Franchises (category 14)	not recorded	not recorded	0	0

1 eq = equivalent

2 The figure does not include data from Sigma-Aldrich since the integration process is still underway.

3 Already covered under Scope 1/2 emissions.

4 Merck produces a huge variety of intermediate products for various purposes. Due to their many applications and our customer structure, the associated GHG emissions cannot be tracked in a reasonable fashion.

No data is available for Scope 3 categories not listed above. Their relevance to Merck is assessed in the [Scope 3 document](#).

Biogenic emissions (Scope 3), if present, are not being recorded.

Emissions of ozone-depleting substances (metric tons)

	2012	2013	2014	2015 ¹
Total emissions of ozone-depleting substances	1.9	1.5	0.9	1.4
CFC-11eq ²	0.10	0.08	0.05	0.08

1 The figures exclude Sigma-Aldrich since the integration process is still underway.

2 CFC-11eq is a unit of measure used to compare the potential of various substances to deplete the ozone. Reference figure 1 indicates the potential of CFC-11 to cause the depletion of the ozone layer.

Substances included: R-12, R-22, R-141b, R-402a, R-409a, R-401a.

Source for the emission factors: Montreal Protocol.

Other air emissions (metric kilotons)

	2012	2013	2014	2015 ¹
Volatile organic compounds (VOC)	0.2	0.2	0.3	0.3
Nitrogen oxide	0.2	0.2	0.2	0.2
Sulfur dioxide	0.02	0.02	0.02	0.05
Dust	0.03	0.01	0.02	0.06

1 The figures exclude Sigma-Aldrich since the integration process is still underway.

The increase in dust and sulfur dioxide emissions was caused by the biomass power plant that was commissioned in Goa, India at the end of 2014.

The VOC, nitrogen oxide, sulfur dioxide, and dust emissions reported here are attributable to production activities as well as energy generation. These figures do not include emissions from vehicles. Emissions are determined partially based on measurements and partially based on calculations or estimates. Only some sites are required to measure individual parameters.

Transport of finished goods, by means of transportation¹

	2012	2013	2014	2015
% Truck	58	56	56	53
% Boat	36	37	38	41
% Airplane	6	7	6	6

1 Pertains to goods shipped by our Darmstadt, Gernsheim and Hohenbrunn sites in Germany (excluding Sigma-Aldrich). These figures pertain to the total weight of the transported products. Indicated here is the primary means of transport.

In shipping finished goods from our production sites to the local warehouses of our subsidiaries, we have been working to reduce the use of air shipping in favor of sea freight. This change aims to both reduce costs as well as lower transport-related CO₂ emissions.

Energy consumption¹

in GWh	2012	2013	2014	2015 ²
Total energy consumption	1,528	1,549	1,602	1,720
Direct energy consumption	924	991	1,056	1,171
Natural gas	813	871	919	933
Liquid fossil fuels ³	98	105	110	103
Biomass and self-generated renewable energy	13	15	27	135
Indirect energy consumption	604	558	546	549
Electricity	491	493	460	466
Steam, heat, cold	113	65	86	83
Total energy sold	0.5	0.4	0.6	0.5
Electricity	0.5	0.4	0.6	0.5
Steam, heat, cold	0	0	0	0

in TJ	2012	2013	2014	2015
Total energy consumption	5,501	5,577	5,767	6,193
Direct energy consumption	3,327	3,568	3,801	4,216
Natural gas	2,927	3,136	3,308	3,359
Liquid fossil fuels ³	353	378	396	371
Biomass and self-generated renewable energy	47	54	97	486
Indirect energy consumption	2,174	2,009	1,966	1,977
Electricity	1,768	1,775	1,656	1,678
Steam, heat, cold	407	234	310	299
Total energy sold	2	1	2	2
Electricity	2	1	2	2
Steam, heat, cold	0	0	0	0

1 In line with the Greenhouse Gas Protocol, for all previous years (up to the 2006 baseline) the energy consumption has been calculated based on the current corporate structure of the reporting year and retroactively adjusted for acquisitions or divestments of (parts of) companies, or for changes in emission factors (portfolio-adjusted).

2 The figures exclude Sigma-Aldrich since the integration process is still underway.

3 Light and heavy fuel oil, liquified petroleum gas (LPG), diesel and gasoline.

At our sites in Billerica, Massachusetts (USA), Bedford, Massachusetts (USA), Molsheim (France), Tel Aviv (Israel), Rome (Italy), Ciudad de Guatemala (Guatemala), and Shanghai (China), we use photovoltaics to produce power. The increase in biomass and self-generated renewable energy consumption is attributable to the biomass power plants that were commissioned in Goa, India, and Jaffrey, New Hampshire (USA) in 2014.

Merck currently only records purchased secondary energy – this is primarily electricity and, to a lesser extent, heat/steam/cold. Details on the local energy mix, including the respective percentage of primary energy, renewable energy, etc. are not available. Data on local energy efficiency in electricity or heat generation are not available either. Our production sites are located in countries with a widely varying energy mix.

Our Darmstadt and Gernsheim sites in Germany consume the most energy, representing 37% of our Group-wide total. At these sites, fossil energy (coal, gas, etc.) accounts for approx. 55%, nuclear energy approx. 17% and renewable energies approx. 28% of the energy mix.

Renewable energies account for a higher share of electricity generation at production sites in Switzerland, with nuclear energy taking the lead in France. Based on an estimated global energy efficiency of 37% for the conversion and distribution of generated electricity, this results in a primary energy consumption of 1,260 GWh for 2015. Based on an estimated global energy efficiency of 85% for heat/steam/cold, this results in a primary energy consumption of 98 GWh for 2015. This yields a total primary energy consumption of 1,358 GWh for 2015. The calculation is based on factors stated in the "Handbuch für betriebliches Energiemanagement - Systematisch Energiekosten senken" ("Manual for energy management in practice - Systematically reducing energy costs") published by DENA, 12/2012.

In 2015, Merck's energy intensity relative to net sales totaled 0.134 kWh/€.

Water consumption (millions of m³)

	2012	2013	2014	2015 ¹
Total water consumption	16.3	9.6	11.1	11.6
Surface water (rivers, lakes)	7.0	0.0	0.3	0.3
Groundwater	5.3	5.4	6.3	6.7
Drinking water (from local suppliers)	4.0	4.2	4.5	4.6
Rain water and other sources	0.01	0.01	0.03	0.03

1 The figures exclude Sigma-Aldrich since the integration process is still underway.

These figures do not include the ground water that we use for safety measures at the Gernsheim site in Germany. Here, the water is fed back directly into natural circulation.

Water reused (millions of m³)

	2012	2013	2014	2015 ¹
Water reused	17.8	16.6	16.0	23.0

1 The figure does not include data from Sigma-Aldrich since the integration process is still underway.

The increase in reused water in 2015 is attributable to the recirculating cooling system that went on line at our facility in Darmstadt, Germany. This system provides recirculating cooling water to both our new co-generation unit as well as our new cold and compressed air generator.

Wastewater volume and quality

	2012	2013	2014	2015 ¹
Total wastewater volume (millions of m³)	8.5	8.6	10.1²	10.0
Chemical oxygen demand (metric tons of O ₂)	929	756	1,319 ²	1,384
Phosphorous (metric tons)	7	7	11	11
Nitrogen (metric tons)	76	77	81	108
Zinc (kg)	267	293	288	280
Chromium (kg)	21	23	36 ²	41
Copper (kg)	37	36	34	62
Nickel (kg)	101	110	128	126
Lead (kg)	35	42	55	53
Cadmium (kg)	10	10	10	13
Mercury (kg)	1	1	1	1
Arsenic (kg)	3	4	4	4

1 The figures exclude Sigma-Aldrich since the integration process is still underway.

2 Figures retroactively adjusted.

The wastewater volume includes indirect discharge into both public and Merck-owned wastewater treatment plants, as well as direct discharge (such as rainwater and cooling water).

The wastewater treatment plant at our Gernsheim, Germany site also treats wastewater from the neighboring municipality of Biebesheim. The communal wastewater from Biebesheim is included in the wastewater volume as well as in the emissions stated in the table.

Emissions are determined partially based on measurements and partially based on calculations or estimates. Only some sites are required to measure individual parameters.

Hazardous and non-hazardous waste (metric kilotons)

	2012	2013	2014	2015 ¹
Total waste	189	161	228²	295
Hazardous waste disposed ³	62	37	53	55
Non-hazardous waste disposed ³	36	31	55	31
Hazardous waste recycled	48	50	49 ²	59
Non-hazardous waste recycled	43	43	71	150

1 The figures exclude Sigma-Aldrich since the integration process is still underway.

2 Figures retroactively adjusted.

3 Disposed = incineration and landfill.

The amount of "non-hazardous waste disposed" decreased in 2015 because there was less landfill needing disposal.

The increase in "non-hazardous waste recycled" can be attributed to the sharp rise in landfill, construction waste, and demolition waste. Landfill, construction waste, and demolition waste accounted for 47% of total waste in 2014, and 53% of total waste in 2015.

Exported/Imported hazardous waste (metric kilotons)

	2012	2013	2014	2015 ¹
Exported ²	not recorded	7.1	9.6 ³	4.3
Imported ⁴	not recorded	0.01	0.003	0.01

1 The figures exclude Sigma-Aldrich since the integration process is still underway.

2 Disposal within the EU.

3 Figure retroactively adjusted.

4 As part of the return system for our cell tests, these kits are brought to our Gernsheim site in Germany for proper disposal.

Waste by disposal method

	2012	2013	2014	2015 ¹
Total waste (metric kilotons)	189	161	228²	295
Disposed waste (metric kilotons)	98	67	108	86
Landfilled waste (metric kilotons)	19	13	37	12
Incinerated waste (metric kilotons)	79	54	71	74
Recycled waste (metric kilotons)	91	94	120²	209
Material recycling (metric kilotons)	67	69	93 ²	181
Waste-to-energy (metric kilotons)	24	25	27	28
Recycling rate (%)	48	58	53	71

1 The figures exclude Sigma-Aldrich since the integration process is still underway.

2 Figures retroactively adjusted.

The waste output of the Merck Group rose to 295 metric kilotons in 2015 (228 metric kt in 2014). Waste from construction and renovation projects accounted for the majority of the waste (2014: 47%; 2015: 53%), stemming in particular from the remodeling of our Global headquarters in Darmstadt. In 2014, roughly 50 metric kilotons of this waste was recycled, with approximately 124 metric kilotons recycled in 2015.

Significant spills

	2012	2013	2014	2015 ¹
Total number of significant spills	0	0	0	0

1 The figure does not include data from Sigma-Aldrich since the integration process is still underway.

Indicators: Community

Spending on community involvement (€ million)

	2012	2013	2014	2015 ¹
Total spending	11.8	46.2	50.8	100.0

1 The figure does not include data from Sigma-Aldrich since the integration process is still underway.

We calculate the value of pharmaceutical product donations according to the WHO Guidelines for Medicine Donations; for other product donations, we apply their fair value.

The increase in our community involvement spending is attributable to the expansion of the Merck Praziquantel Donation Program (MPDP) as well as the expansion of the Erbitux® China Patient Assistance Program. In the Merck Praziquantel Donation Program, we are partnering with the World Health Organization to combat the worm disease schistosomiasis in African school children. Through the Erbitux® China Patient Assistance Program, roughly 90% of the costs for Erbitux® treatment can be covered for colorectal cancer patients with a good prognosis.

Spending on community involvement, by region (%)¹

	2012	2013	2014	2015 ²
Europe	20	36	37	8
North America	13	1	< 2	1
Asia-Pacific (APAC)	59	61	60	91
Latin America	8	< 1	< 2	< 1
Middle East and Africa (MEA)	< 1	< 1	< 1	< 1

1 Excluding spending for the Global Pharma Health Fund, the Merck Praziquantel Donation Program and the Deutsche Philharmonie Merck. As regards segment reporting by country and region, the composition of regions was adjusted and the corresponding comparative year-earlier figures are presented. The regional reporting structure now comprises five regions: Europe, North America, Asia-Pacific, Latin America as well as Middle East and Africa.

2 The figures exclude Sigma-Aldrich since the integration process is still underway.

In 2015, the significant increase in spending on the Erbitux® China Patient Assistance Program led to a relative rise in spending in our Asia-Pacific (APAC) region, and a relative decrease in spending in other regions.

Focus of local community involvement (%)¹

	2012	2013	2014	2015 ²
Disaster relief	3	6	4	6
Education	16	23	23	25
Environment	9	10	10	7
Health	30	23	33	33
Support for culture and sports activities near our sites	28	19	15	8
Other	14	19	15	21

1 Based on number of projects, excluding the Global Pharma Health Fund, Merck Praziquantel Donation Program and Deutsche Philharmonie Merck.

2 The figures exclude data from Sigma-Aldrich since the integration process is still underway.

Motivations for our community involvement (%)¹

	2012	2013	2014	2015 ²
Charitable activities	32	20	9	3
Community investment	52	59	59	92
Commercial initiatives in the community	16	21	32	5

1 Based on total spending, excluding spending for the Global Pharma Health Fund, the Merck Praziquantel Donation Program and the Deutsche Philharmonie Merck.

2 The figures exclude Sigma-Aldrich since the integration process is still underway.

In 2015, the significant increase in spending on the Erbitux® China Patient Assistance Program, which falls under "Community investment", led to a relative decrease in spending in other areas.

We categorize the motivations for our activities based on the London Benchmarking Group model as well as the guidelines of the Bertelsmann Foundation for corporate social responsibility. Projects that primarily aim to make improvements within the community are classified as "community investment".

Initiatives that are predominantly aimed at company-relevant factors such as image or personnel recruitment are classified as "commercial initiatives in the community". "Charitable activities" covers any other projects that benefit a charitable organization, but cannot be listed under either of the other two motivation categories due to missing data or their narrow scope.