

indicators

ECONOMICS

Net sales, operating result (EBIT) and research and development costs, by business sector^{1,2}

€ million	Healthcare	Life Science	Performance Materials	Group
2017				
Net sales	6,190 ³	5,882	2,446	14,517³
Operating result (EBIT)	1,337 ³	834	689	2,423³
R&D costs	1,600 ³	241	225	2,108³
2018				
Net sales	6,246	6,185	2,406	14,836
Operating result (EBIT)	731	1,036	508	1,727
R&D costs	1,686	249	242	2,225

1 As a non-operating segment, Corporate and Other is not shown here as a separate item, but rather under Segment Reporting in our 2018 Annual Report.

2 Figures comprise the continuing operations of the Merck Group excluding the Consumer Health business.

3 Figure retroactively adjusted; see Consolidated Financial Statements in our 2018 Annual Report.

business ethics

Part of the non-financial report

Internal audits on corruption and Human Rights Charter

	2015	2016 ¹	2017	2018 Merck Group ²	2018 thereof Merck KGaA ³
Number of audits relating to corruption	49	55	50	54	16
% of audits relating to corruption	64	68	65	69	21
Number of audits relating to the workplace requirements of our Human Rights Charter	41	47	45	46	14

1 Includes Sigma-Aldrich as of 2016

2 Consumer Health business has been out of Internal Auditing scope since September 2017.

3 Includes global audits which are conducted at the headquarters in Darmstadt and/or the management of the audited function is reporting into KGaA.

In 2018, we audited 18% of all Merck subsidiaries (status June 2018, excluding minority holdings), covering approximately 27% of all sales generated between the third quarter of 2017 and the second quarter of 2018.

In 2018, during 46 of our audits conducted in 27 countries, we additionally reviewed workplace parameters as per our Human Rights Charter. No violations were identified.

Reported compliance violations

	2015	2016 ¹	2017	2018 Merck Group	2018 thereof Merck KGaA
Total number of reported compliance violations					
Number of reported compliance incidents	33	36	39	72	17
Number of confirmed cases	8	12	14	19	7
confirmed cases by category					
Violation of the Merck Human Rights Charter	0	2	0	0	0
Bribery and Corruption	0	2	1	1	0
Violation of the Merck Pharmaceutical Guidelines	2	4	2	2	0
Violation of Data Privacy and Confidentiality Guidelines	1	0	2	3	3
Manipulation of Business Documents	0	2	1	0	0
Violation of cartel laws and fair competition rules	1	0	0	1	0
Infringements in the areas of finance, accounting and banking	0	0	0	0	0
Theft and fraudulent Actions against Merck	2	1	1	5	1
Other violations of the Merck Compliance Principles for the relations with Business Partners	0	1	2	1	0
Other violations of Merck values, internal guidelines or legal requirements	2	0	5	6	3

1 Includes Sigma-Aldrich as of 2016

Compliance training

	2015	2016 ¹	2017 ¹	2018 Merck Group ²	2018 thereof Merck KGaA ²
Total number of persons trained on anti-corruption guidelines³	20,404	29,764	17,044	11,404	1,254
Total number of employees trained on anti-corruption guidelines	17,378	25,889	13,345	11,155	1,245
% of employees trained on anti-corruption	43	51	25	22	11
by employee category					
Number of Role 2+ employees trained on anti-corruption	12,747	14,379	7,080	9,257	1,017
% of Role 2+ employees trained on anti-corruption	64	84	27	36	19
% of employees below Role 2 trained on anti-corruption	22	34	23 ⁴	7	4
by region (%)⁵					
Europe	–	54	18	19	11
North America	–	57	46	36	not applicable
Asia-Pacific (APAC)	–	38	25	16	not applicable
Latin America	–	52	19	12	not applicable
Middle East and Africa (MEA)	–	66	29	18	not applicable

¹ From 2016 on, these figures include Sigma-Aldrich, however as of Dec. 31, 2017 the job grading system had not yet been implemented for employees of Sigma-Aldrich legal entities in Germany, or for employees of Allergopharma. In the facts and figures, these employees are included under "employees below Role 2".

² In 2018, our job grading system had not yet been applied to the employees of Sigma Aldrich in Steinheim (Germany), or to those of Allergopharma. In the facts and figures for 2018, these employees are included under "employees below Role 2".

³ Includes contractors, external supervised workers (e.g. temps) and contract partners working on-site who were trained on anti-corruption guidelines (2018: 249).

⁴ Figure retroactively adjusted.

⁵ As of 2016, we are also reporting the training rate by region. No such data was tracked for the preceding year.

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 Role 2+.

Our compliance and anti-corruption principles are communicated to all our business partners, who undergo a Business Partner Risk Management (BPRM) process.

Training increased in 2016, due to the initial integration of employees of Sigma-Aldrich, a company acquired at the end of 2015.

Legal actions

	2015	2016	2017	2018 Merck Group ¹	2018 thereof Merck KGaA
Total number² of legal actions pending or completed (for anti-competitive behavior, violations of anti-trust or violations of monopoly legislation)	2	2	3	3	2
pending	2	2	3	3	2
completed	0	0	0	0	0

1 Excludes Consumer Health

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 2015](#), pages 128-129 and pages 212-213, no. 27
- [Annual Report 2016](#), pages 135-136 and pages 228-229, no. 26
- [Annual Report 2017](#), pages 148-150 and pages 252-254, no. 27
- [Annual Report 2018](#), pages 146-148 and pages 247-251, no. 26

Customer privacy¹

	2015	2016	2017 ²	2018
Total number of substantiated complaints received from outside parties	0	0	0	0
Total number of complaints from regulatory bodies	0	0	0	0
Total number of identified leaks, thefts, or losses of customer data	0	1	0	1

1 This data only reflects incidents classified as significant.

2 Includes Sigma-Aldrich as of 2017

Employees

Part of the non-financial report

Total number of employees

As of Dec. 31	2015	2016	2017	2018 Merck Group	2018 thereof Merck KGaA
Total number of employees	49,613	50,414	52,941	51,749	11,133
Men	28,997	28,848	30,083	29,006	7,036
Women	20,616	21,566	22,858	22,743	4,097

Number of employees by hierarchical level

As of Dec. 31	2015 ¹	2016 ¹	2017 ¹	2018 Merck Group ²	2018 thereof Merck KGaA ²
Total employees	49,613	50,414	52,941	51,749	11,133
Senior management (Role 6+)	146	181	197	193	94
Middle management (Role 4 & 5)	2,211	2,685	2,927	3,095	1,155
Low management (Role 3)	6,622	8,139	8,904	9,019	2,661
Other employees (below Role 3)	40,634	39,409	40,913	39,442	7,223
% of women (total)	41	43	43	44	37
thereof in senior management (Role 6+)	21	25	30	36	17
thereof in middle management (Role 4 & 5)	611	805	917	1,025	368
thereof in low management (Role 3)	2,636	3,361	3,714	3,795	1,036
thereof other employees (below Role 3)	17,348	17,375	18,197	17,888	2,676
% of men (total)	59	57	57	56	63
thereof in senior management (Role 6+)	125	156	167	157	77
thereof in middle management (Role 4 & 5)	1,600	1,880	2,010	2,070	787
thereof in low management (Role 3)	3,986	4,778	5,190	5,224	1,625
thereof other employees (below Role 3)	23,286	22,034	22,716	21,554	4,547
by age group					
Up to 29 years old (%)	15	15	15	15	14
thereof in senior management (Role 6+)	0	0	0	0	0
thereof in middle management (Role 4 & 5)	5	7	3	5	3
thereof in low management (Role 3)	130	183	194	211	111
thereof other employees (below Role 3)	7,424	7,229	7,479	7,279	1,460
30 to 49 years old (%)	64	62	62	61	54
thereof in senior management (Role 6+)	68	76	72	69	32
thereof in middle management (Role 4 & 5)	1,407	1,670	1,782	1,829	692
thereof in low management (Role 3)	4,770	5,784	6,308	6,206	1,766
thereof other employees (below Role 3)	24,815	23,996	24,733	23,536	3,497
50 years or older (%)	21	23	23	24	32
thereof in senior management (Role 6+)	78	105	125	124	62
thereof in middle management (Role 4 & 5)	799	1,008	1,142	1,261	460
thereof in low management (Role 3)	1,722	2,172	2,402	2,602	784
thereof other employees (below Role 3)	8,395	8,184	8,701	8,627	2,266

¹ From 2015 on, these figures include Sigma-Aldrich, however as of Dec. 31, 2017 the job grading system had not yet been implemented for employees of Sigma-Aldrich legal entities in Germany, or for employees of Allergopharma. In the facts and figures, these employees are included under "other employees (below Role 3)".

² In 2018, our job grading system had not yet been applied to the employees of Sigma Aldrich in Steinheim (Germany), or to those of Allergopharma. In the facts and figures for 2018, these employees are included under "other employees (below Role 3)".

Average number of employees by functional area¹

	2015	2016	2017	2018 ²
Group	41,511	50,439	52,053	53,809
Thereof women	17,180	21,136	22,353	23,388
Production	11,563	14,829	15,571	16,240
Thereof women	3,642	4,698	5,059	5,359
Logistics/Supply Chain ³	2,581	3,955	3,729	4,014
Thereof women	913	1,459	1,442	1,569
Marketing and Sales/Commercials ³	12,871	14,887	15,115	15,479
Thereof women	5,204	6,401	6,609	6,981
Administration	6,763	8,190	9,286	9,864
Thereof women	3,757	4,421	4,798	5,067
Research and Development	5,097	6,249	6,789	7,245
Thereof women	2,674	3,274	3,591	3,871
Infrastructure and Other	2,636	2,329	1,564	966
Thereof women	990	883	854	541

¹ The average employee headcount is calculated by adding up all employees at the end of each of the last 13 months, 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.

² The average employee headcount for fiscal 2018 incorporates the Consumer Health employees on a pro rata basis up until the end of November 2018 due to the divestment of the Consumer Health business as of December 1, 2018.

³ In conjunction with the new job architecture implemented in 2017, some functional areas have been renamed and reorganized. Due to the new structure from 2017 on, it will only be possible to deliver a limited trend forecast in a year-on-year comparison.

Number of employees by region

As of Dec. 31	2015	2016	2017	2018 Merck Group	2018 thereof Merck KGaA
Total	49,613	50,414	52,941	51,749	11,133
Europe	23,429	24,438	25,980	25,792	11,133
women	10,316	10,884	11,627	11,464	4,097
women (%)	44	45	45	44	37
Number of employees with temporary contracts	1,079	1,031	1,279	1,209	483
% of employees with temporary contracts	5	4	5	5	4
North America	9,794	10,037	10,520	10,978	0
women	4,183	4,308	4,518	4,742	not applicable
women (%)	43	43	43	43	not applicable
Number of employees with temporary contracts	22	122	138	148	not applicable
% of employees with temporary contracts	0.2	1	1	1	not applicable
Asia-Pacific (APAC)	11,096	10,754	11,294	10,486	0
women	3,706	3,981	4,298	4,348	not applicable
women (%)	33	37	38	41	not applicable
Number of employees with temporary contracts	1,888	2,231	2,603	2,846	not applicable
% of employees with temporary contracts	17	21	23	27	not applicable
Latin America	4,352	4,140	4,050	3,340	0
women	1,986	1,910	1,896	1,648	not applicable
women (%)	46	46	47	49	not applicable
Number of employees with temporary contracts	43	40	40	62	not applicable
% of employees with temporary contracts	1	1	1	2	not applicable
Middle East and Africa (MEA)	942	1,045	1,097	1,153	0
women	425	483	519	541	not applicable
women (%)	45	46	47	47	not applicable
Number of employees with temporary contracts	127	153	172	189	not applicable
% of employees with temporary contracts	13	15	16	16	not applicable

External contractors are currently not logged in our employee data system, nor do we currently have any plans to integrate them.

Employees by business sector

As of Dec. 31	2015	2016	2017	2018
Healthcare employees	18,566	18,837	19,795	17,456
Thereof women	8,522	9,090	9,656	8,884
Thereof women (%)	46	48	49	51
Life Science employees	18,611	19,178	19,607	20,667
Thereof women	7,883	7,928	8,276	8,837
Thereof women (%)	42	41	42	43
Performance Materials employees	6,228	5,469	5,529	5,278
Thereof women	1,531	1,427	1,455	1,411
Thereof women (%)	25	26	26	27

Employees by contract type

As of Dec. 31	2015	2016	2017	2018
Total employees	49,613	50,414	52,941	51,749
Number of employees with permanent contracts	46,454	46,837	48,709	47,295
% of employees with permanent contracts	94	93	92	91
thereof women	19,034	19,741	20,741	20,545
thereof women (%)	41	42	43	43
Number of employees with temporary contracts	3,159	3,577	4,232	4,454
% of employees with temporary contracts	6	7	8	9
thereof women	1,563	1,744	2,117	2,198
thereof women (%)	49	49	50	49
full-time employees	47,292	48,056	50,498	49,273
% full-time	95	95	95	95
thereof women	18,557	19,457	20,677	20,577
thereof women (%)	39	40	41	42
part-time employees	2,321	2,358	2,443	2,476
% part-time	5	5	5	5
thereof women	2,059	2,109	2,181	2,166
thereof women (%)	89	89	89	87

New employees

As of Dec. 31	2015 ¹	2016	2017	2018 Merck Group	2018 thereof Merck KGaA
Total number of new employee hires	5,710	7,085	7,285	7,129	696
by age group					
Up to 29 years old	2,088	2,930	2,940	2,967	332
30 to 49 years old	3,252	3,736	3,848	3,728	331
50 or older	370	419	497	434	33
by gender					
Women	2,450	3,388	3,412	3,401	298
Men	3,260	3,697	3,873	3,728	398
by region					
Europe	2,119	2,689	3,058	2,560	696
North America	730	1,348	1,603	1,524	0
Asia-Pacific (APAC)	1,913	2,201	1,955	2,222	0
Latin America	780	636	497	583	0
Middle East and Africa (MEA)	168	211	172	240	0
Rate of new employee hires² (%)	14	14	14	14	6
by age group³					
Up to 29 years old	37	41	40	42	48
30 to 49 years old	57	53	53	52	48
50 or older	6	6	7	6	5
by gender³					
Women	43	48	47	48	43
Men	57	52	53	52	57
by region³					
Europe	37	38	42	36	100
North America	13	19	22	21	not applicable
Asia-Pacific (APAC)	33	31	27	31	not applicable
Latin America	14	9	7	8	not applicable
Middle East and Africa (MEA)	3	3	2	3	not applicable

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.

Staff turnover^{1,2}

	2015	2016 ³	2017	2018 Merck Group ⁴	2018 thereof Merck KGaA
Total turnover rate	10.38	12.07	9.05	9.09	2.13
Turnover rate by gender					
Men	10.13	12.87	8.75	9.03	2.21
Women	10.73	10.96	9.46	9.18	1.99
Turnover rate by age group					
Up to 29 years old	17.49	19.20	13.66	14.24	3.51
30 to 49 years old	9.69	11.37	8.38	8.53	1.79
50 or older	8.08	9.19	7.87	7.39	2.10
Turnover rate by region					
Europe	6.22	6.23	6.22	5.73	2.13
North America	12.72	11.50	11.02	9.90	not applicable
Asia-Pacific (APAC)	15.95	22.37	12.53	14.51	not applicable
Latin America	15.29	18.85	13.74	15.41	not applicable
Middle East and Africa (MEA)	12	10.80	11.22	9.77	not applicable
Total number of leavers	4,168	6,087	4,710	4,613	233
by gender					
Men	2,386	3,771	2,596	2,578	153
Women	1,782	2,316	2,114	2,035	80
by age group					
Up to 29 years old	943	1,464	1,058	1,061	56
30 to 49 years old	2,505	3,589	2,713	2,649	106
50 or older	720	1,034	939	903	71
by region					
Europe	1,290	1,490	1,488	1,457	233
North America	638	1,132	1,143	1,064	0
Asia-Pacific (APAC)	1,540	2,543	1,387	1,468	0
Latin America	618	814	570	522	0
Middle East and Africa (MEA)	82	108	122	102	0

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 headcount is calculated as follows: Total number of leavers from the past 12 months divided by the average employee headcount multiplied by 100.

3 Includes Sigma-Aldrich as of 2016

4 Excludes Consumer Health

In 2018, the average length of service for employees Group-wide was 10 years (2017: 9.8 years), with 14.9 years (2017: 14.6 years) for Merck KGaA employees.

Work-related accidents¹

	2015	2016	2017	2018 Merck Group	2018 thereof Merck KGaA
Lost Time Injury Rate (LTIR = work- place accidents resulting in missed days of work per one million man-hours)	1.4	1.3	1.5	1.3	2.8
by region					
Europe	2.6	2.2	2.4	1.9	2.8
North America	0.9	1.1	1.0	1.1	not applicable
Asia-Pacific (APAC)	0.3	0.4	0.3	0.3	not applicable
Latin America	0.7	0.4	1.3	1.5	not applicable
Middle East and Africa (MEA)	0.5	1.6	0.0	0.7	not applicable
Number of deaths	2	0	0	0	0
by region					
Europe	1	0	0	0	0
North America	1	0	0	0	0
Asia-Pacific (APAC)	0	0	0	0	0
Latin America	0	0	0	0	0
Middle East and Africa (MEA)	0	0	0	0	0
by gender					
Women	1	0	0	0	0
Men	1	0	0	0	0

¹ Including supervised workers

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. 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.

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.

For Merck KGaA (about 22% of the employees of the Merck Group), we only report work-related illnesses if these have been certified as an occupational illness by the employers' liability insurance association. In 2018 period, two cases of work-induced illness were verified (as of the end of August 2018).

Employees who regularly receive a performance and development evaluation

	2015 ¹	2016 ²	2017 Merck Group ²	2018 Merck Group ^{3, 4}	2018 thereof Merck KGaA
% of employees who receive a performance and development evaluation	88	97	97	98	100
by gender					
Women	90	97	97	99	100
Men	87	97	97	98	100
by employee category⁵					
Senior management (Role 6+)	100	100	100	100	100
Middle management (Role 4 & 5)	100	100	100	100	100
Low management (Role 3)	100	100	100	100	100
Other employees (below Role 3)	85	96	96	98	100

1 The 2015 data is based on a reporting date of February 29, 2016.

2 From 2016 on, figures include Sigma-Aldrich, but as of Dec. 31 2017, the job grading system had not yet been implemented for employees of Sigma-Aldrich legal entities in Germany and of Allergopharma. In the facts and figures for 2018, the employees whose positions had not been graded are included under "Other employees (below Role 3)".

3 Excludes Consumer Health

4 In 2018, our job grading system had not yet been applied to the employees of Sigma Aldrich in Steinheim (Germany), or to those of Allergopharma. In the facts and figures for 2018, the employees whose positions had not been graded are included under "Other employees (below Role 3)".

5 In 2017, we switched our job architecture from a Global Grading System to Roles. Figures have been retroactively adjusted for previous years.

Regular feedback and employee performance evaluations are essential to fairly ranking individual performance and to helping all employees follow their own career path at Merck. Our globally uniform Performance and Talent Management Process requires annual feedback meetings and performance assessments for all employees rated Role 2 and up in the job grading system that was used since 2017. Figures have been retroactively adjusted for previous years. Apart from evaluating employee performance, this helps us to identify individual development opportunities.

When it comes to applying this process, our individual subsidiaries can decide for themselves whether to include employees rated below Role 2. In Germany, all permanent employees have been participating in the Performance and Talent Management Process since 2013. In 2018, a total of 50,920 employees worldwide were involved in the process. The Performance and Talent Management Process is coordinated via our online platform HR4You.

Internationality of employees

As of Dec. 31	2015 ¹	2016 ²	2017 ²	2018 Merck Group ³	2018 thereof Merck KGaA
Number of nationalities	122	129	131	136	90
Number of nationalities in management positions (Role 4 or above)	64	70	65	70	41
% of non-Germans in management positions (Role 4 or above)	61	65	64	64	17

1 These figures do not include the employees of Sigma-Aldrich, a company that was acquired in November 2015. As of December 31, 2015, the job grading system had not yet been implemented there.

2 From 2016 on, figures include Sigma-Aldrich. However, as of Dec. 31 2017, the job grading system had not yet been implemented for employees of Sigma-Aldrich legal entities in Germany or for employees of Allergopharma.

3 In 2018, our job grading system had not yet been applied to the employees of Sigma Aldrich in Steinheim (Germany), or to those of Allergopharma.

Employee age by region

As of Dec. 31

Number of employees	Worldwide	North America	Europe (including Germany)	Merck KGaA	Asia-Pacific (APAC)	Latin America	Middle East and Africa (MEA)
2017							
Up to 29 years old	7,676	1,438	3,272	1,589	2,257	521	188
thereof women	3,512	608	1,585	634	945	294	80
30 to 49 years old	32,895	5,465	15,680	5,838	8,099	2,913	738
thereof women	14,540	2,423	7,287	2,195	3,074	1,405	351
50 or older	12,370	3,617	7,028	3,250	938	616	171
thereof women	4,806	1,487	2,755	1,069	279	197	88
Average age	41.4	44.1	42.5	42.6	36.9	40.3	39.4
Total employees	52,941	10,520	25,980	10,677	11,294	4,050	1,097

2018

Up to 29 years old	7,494	1,573	3,175	1,574	2,082	470	195
thereof women	3,534	661	1,537	633	966	285	85
30 to 49 years old	31,638	5,636	15,247	5,987	7,616	2,342	799
thereof women	14,238	2,511	7,044	2,281	3,123	1,183	377
50 or older	12,611	3,769	7,370	3,572	788	528	159
thereof women	4,971	1,570	2,883	1,183	259	180	79
Average age	41.7	44.1	42.8	42.9	36.9	40.4	39.2
Total employees	51,749	10,978	25,792	11,133	10,486	3,340	1,153

Age of youngest employee

As of Dec. 31	2015	2016 ¹	2017	2018
Age of youngest employee, excluding apprentices	17	17	18	17

¹ Includes Sigma-Aldrich as of 2016

Voluntary insurance benefits (voluntarily introduced and (co-) financed)

As of Dec. 31	2015	2016 ¹	2017	2018 Merck Group	2018 thereof Merck KGaA
% of employees with healthcare benefits ²	–	68 ³	68	67	0
% of employees with Group accident insurance ⁴	–	39	42	39	5
% of employees with life insurance ⁵	–	57	58	58	0
% of employees with disability insurance (short-term and long-term) ⁶	–	32	35	37	0

1 Since 2016, we have been reporting voluntary insurance benefits that we offer our employees. No such data was tracked for the preceding year.

2 Any spend on voluntarily introduced and (co-) financed healthcare benefits for employees and possibly their dependents. Not taking into consideration any mandatory social security cover (mostly covered by an insurance policy).

3 Figure retroactively adjusted.

4 Any spend on voluntarily introduced and (co-) financed accident insurance that pays a defined amount in case of death or disability caused by a work-related accident (not taking into consideration any mandatory social security cover, e.g. workman's compensation).

5 Any spend on voluntarily introduced and (co-) financed life insurance cover that pays a defined amount of money in case of natural death (not accidental).

6 Any spend on voluntarily introduced and (co-) financed insurance cover that disability pays for salary continuation in case of inability to work caused by an insured incident.

All our employees are covered by either statutory or voluntary accident and health insurance. Employees of Merck KGaA are covered by statutory insurance as stipulated by the regulations in force in Germany.

We offer a company pension in numerous countries along with various programs for supplemental company pensions and survivor's benefits.

The global benefits listed in the table above are designed to provide additional security to our workforce and their families and to improve their quality of life. Benefits represent voluntarily employer-initiated as well as employer-financed assistance to our workforce in addition to the regular compensation package.

Our benefits offer meaningful choices, where possible, to support a diverse workforce and are sensitive to the needs and customs of the employees who use them, regardless of country, age, family status, interests, or values.

Long-term pension obligations and post-employment benefits

€ million	2015	2016	2017	2018
Present value of all defined benefit obligations as of Dec. 31	4,153	4,698	4,707	4,719
Pension expenses	210	226	304	295

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 (see our Annual Report 2018, Note on Provisions for pensions and other post-employment benefits).

Flexible working hours in Germany

As of Dec. 31	2015	2016 ¹	2017	2018 ²
% of employees utilizing the "mywork@Merck" working model	35	36	40	42

1 Includes Sigma-Aldrich as of 2016

2 Essentially reflects the figures of Merck KGaA.

In coordination with their teams and supervisors, employees taking advantage of "mywork@merck" can choose when and where they work.

Parental leave in Germany

As of Dec. 31	2015 ¹	2016 ¹	2017 ²	2018 ²
Number of employees with a right to parental leave	317	359	353	308
thereof women (recorded via maternity leave in the respective year)	149	191	151	188
thereof men (recorded via special paternity leave in the respective year)	168	168	202	120
Number of employees who took parental leave ³	485	480	352	500
thereof women	301	303	150	240
thereof men	184	177	202	260
Number of employees on parental leave who worked part time during their leave	102	102	49	128
thereof women	99	95	47	109
thereof men	3	7	2	19
Number of employees who returned from parental leave	183	174	312	312
thereof women	51	62	143	65
thereof men	132	112	169	247
Return to work rate (%)	37.7	36.3	88.6	62.4
thereof women	16.9	20.5	95.3	27.1
thereof men	71.7	63.3	83.7	95.0
Number of employees still working for Merck one year after their return from parental leave	184	190	238	– ⁴
thereof women	55	73	89	– ⁴
thereof men	129	117	149	– ⁴
Retention rate (%)	96.8	95.6	89.8	– ⁴
thereof women	98.2	93.8	85.6	– ⁴
thereof men	96.3	96.8	92.5	– ⁴

1 Figures only pertain to the Darmstadt and Gernsheim sites in Germany (which accounted for around 22% of Merck Group employees in 2018). Figures are calculated on the basis of the data from one entire year, which also includes those employees who took parental leave during the calendar year but who had not returned by Dec. 31.

2 Figures pertain only to Merck KGaA (which accounted for around 20% of Merck Group employees in 2017, and roughly 22% in 2018). Figures are calculated on the basis of the data from one entire year, which also includes those employees who took parental leave during the calendar year but who had not yet returned by Dec. 31.

3 Since parental leave can be taken for a period ranging from one month to three years, it is possible for employees to be recorded across a period of up to four calendar years. This explains why the number of employees on parental leave exceeds the number of employees who have a right to it.

4 Figure will be available on Dec. 31, 2019.

Employees with disabilities¹ (%)

As of Dec. 31	2015	2016	2017	2018
Employees with disabilities ¹	4.7	4.5	4.3	4.3

1 Only pertains to Merck KGaA (which accounted for around 22% of Merck Group employees in 2018, calculations based on the German Social Code IX - SGB IX).

Apprentices

As of Dec. 31	2015 ¹	2016 ²	2017 ²	2018
Number of apprentices	506	576	588	604
% of apprentices	5.3	4.6	4.4	4.5

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

2 Only pertains to Merck sites in Germany (approximately 25% of the Group's total workforce in 2016, 2017 and 2018). Essentially reflects the figures of Merck KGaA.

Environment

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

metric kilotons	2006 ²	2015	2016	2017	2018
Total CO₂eq³ emissions	786	722	689	704	698
Thereof					
direct CO ₂ eq emissions	378	391	384	373	354
indirect CO ₂ eq emissions	408	331	305	331	344
Biogenic CO₂ emissions	0	13	14	13	13

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 as of Dec. 31 of the reporting year and retroactively adjusted for acquisitions (e.g. Sigma-Aldrich in 2015) or divestments of (parts of) companies, or for changes in emission factors (portfolio-adjusted).

2 Baseline for our emission targets is 2006.

3 eq = equivalent

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 2018, we emitted 0.047 kg of CO₂eq per euro of net sales.

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

	2015 ¹	2016 ^{1,2}	2017	2018 ³
Total gross other indirect emissions (metric kilotons CO₂eq⁴)	349	426	353	380
Fuel- and energy-related emissions, not included in Scope 1 or 2 (category 3)	95	127	118	131
Waste generated in operations (category 5)	123	127	68	80
Business travel - air travel (category 6)	79	103 ⁵	98	103
Business travel - rail travel (category 6) ⁶	0.02	0.02	0.02	0.02
Business travel - rental car travel (category 6)	1.1	0.6	0.6	1.4
Employee commuting (category 7)	51	68	68	66
Upstream leased assets (category 8)	0.0 ⁷	0.0 ⁷	0.0 ⁷	0.0 ⁷
Processing of sold products (category 10)	0.0 ⁸	0.0 ⁸	0.0 ⁸	0.0 ⁸
Downstream leased assets (category 13)	0	0	0	0
Franchises (category 14)	0	0	0	0

1 Because of the characteristics of the Scope 3 emissions data we do not correct these data subsequently.

2 Includes Sigma-Aldrich as of 2016

3 Excludes Consumer Health

4 eq = equivalent

5 This figure covers roughly 95% of the employees of the Merck Group because the data for the employees of Sigma-Aldrich, acquired in November 2015, are only partially available.

6 German Railway

7 Already covered under Scope 1 and 2 emissions

8 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	2015	2016	2017	2018 ¹
Total emissions of ozone-depleting substances	2.5	2.2	1.9 ²	1.5
CFC-11eq ³	0.1	0.1	0.1	0.1

1 Excludes Consumer Health

2 Figure retroactively adjusted.

3 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	2015	2016 ¹	2017	2018 ²
Volatile organic compounds (VOC)	0.3	0.3	0.3	0.3
Nitrogen oxide	0.3	0.2	0.2	0.3
Sulfur dioxide	0.05	0.05	0.03	0.01
Dust	0.06	0.02	0.04	0.01

1 Includes Sigma-Aldrich as of 2016

2 Excludes Consumer Health

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 transportation

	2015 ¹	2016 ²	2017	2018
% Truck	53	71	73	74
% Boat	41	18	15	14
% Airplane	6	11	12	12

1 The figures of 2015 pertain to goods shipped by our Darmstadt, Gernsheim and Hohenbrunn sites in Germany (excluding Sigma-Aldrich).

2 From 2016 on, the figures contain the volumes of the biggest global distribution centers of our Healthcare, Life Science and Performance Materials business sectors. These figures pertain to the total weight of transported products and indicate 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	2015	2016	2017	2018
Total energy consumption	2,141	2,117	2,194	2,232
Direct energy consumption	1,343	1,330	1,319	1,322
Natural gas	1,200	1,260	1,254	1,256
Liquid fossil fuels ²	110	36	32	32
Biomass and self-generated renewable energy	33	34	33	34
Indirect energy consumption	798	787	875	910
Electricity	702	692	729	761
Steam, heat, cold	96	95	146	149
Total energy sold	0.3	0.3	0.1	0.0
Electricity	0.3	0.3	0.1	0.0
Steam, heat, cold	0	0	0	0

In TJ				2018
Total energy consumption	7,708	7,621	7,898	8,035
Direct energy consumption	4,835	4,788	4,748	4,759
Natural gas	4,320	4,536	4,514	4,522
Liquid fossil fuels ²	396	130	115	115
Biomass and self-generated renewable energy	119	122	119	122
Indirect energy consumption	2,873	2,833	3,150	3,276
Electricity	2,527	2,491	2,624	2,740
Steam, heat, cold	346	342	526	536
Total energy sold	1.1	1.1	0.4	0.0
Electricity	1.1	1.1	0.4	0.0
Steam, heat, cold	0.0	0.0	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 as of Dec. 31 of the reporting year and retroactively adjusted for acquisitions or divestments of (parts of) companies, or for changes in emission factors (portfolio-adjusted).

2 Light and heavy fuel oil, liquefied petroleum gas (LPG), diesel and gasoline

At our sites in Billerica (MA, USA), Bedford (MA, USA), Molsheim (France), Tel Aviv (Israel), Rome (Italy), Guatemala City (Guatemala), Shizuoka-ken (Japan), and Shanghai (China), we use photovoltaics to produce power.

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 29% of our Group-wide total. Here, fossil energy (coal, gas, etc.) accounts for approx. 50.7%, nuclear energy approx. 12.7% and renewable energies approx. 36.6% 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 2,050 GWh for 2018. Based on an estimated global energy efficiency of 85% for heat/steam/cold, this results in a primary energy consumption of 175 GWh for 2018. This yields a total primary energy consumption of 2,225 GWh for 2018. (The calculation is based on factors stated in the "Manual for energy management in practice - Systematically reducing energy costs" published by DENA, 12/2012.)

In 2018, Merck's energy intensity relative to net sales totaled 0.150 kWh/€.

Water consumption

millions of m ³	2015	2016	2017	2018 ¹
Total water consumption	13.7	13.8	14.0	14.7
Surface water (rivers, lakes)	1.8	1.8	1.9 ²	2.1
Groundwater	7.1	7.2	7.3	7.2
Drinking water (from local suppliers)	4.8	4.8	4.8 ²	5.3
Rain water and other sources	0.01	0.01	0.00 ²	0.05

- 1 Excludes Consumer Health
2 Figure retroactively adjusted.

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

Water reused

millions of m ³	2015	2016	2017	2018 ¹
Water reused	23.0	22.7	22.4	24.4

- 1 Excludes Consumer Health

The recirculating cooling system at our Darmstadt, Germany facility accounts for the majority of reused water as it allows the water to be re-utilized multiple times. The volume of reused water is thus greater than the total volume of consumed water.

Wastewater volume and quality

	2015	2016	2017	2018 ^{1, 2}
Total wastewater volume (millions of m³)	12.5³	12.9³	13.1³	13.5
Chemical oxygen demand (metric tons of O ₃)	1,240 ³	1,535	1,669 ³	1,589
Phosphorous (metric tons)	10	12	8	9
Nitrogen (metric tons)	487	379	234 ³	258
Zinc (kg)	491	448	351	– ²
Chromium (kg)	42	34	34	– ²
Copper (kg)	78	48	61	– ²
Nickel (kg)	29 ³	29 ³	32 ³	29
Lead (kg)	32 ³	31 ³	35 ³	28
Cadmium (kg)	9 ³	7 ³	6 ³	6
Mercury (kg)	2	2	1	0
Arsenic (kg)	5	4	3	– ²

- 1 Excludes Consumer Health
2 In alignment with [ICCA reporting](#) requirements specified by Cefic, we track heavy metal emissions from lead, cadmium, nickel, and mercury. These heavy metals are considered to be directly toxic to organisms and are also hazardous to human health due to their carcinogenic properties and their ability to cause harmful effects even in minute quantities. Due to having adopted ICCA reporting standards, we stopped tracking arsenic, chrome, copper, and zinc as of 2018.
3 Figure 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	2015	2016	2017	2018 ¹
Total waste	324²	256²	255²	244
Hazardous waste disposed ³	55	47	43	44
Non-hazardous waste disposed ³	35	38	33 ²	54
Hazardous waste recycled ⁴	77 ²	82 ²	72 ²	74
Non-hazardous waste recycled ⁴	157	89	107 ²	72

1 Excludes Consumer Health

2 Figure retroactively adjusted.

3 Disposed = incineration (without energy recovery) and landfill

4 Recycled = incineration (with energy recovery) and material recycling

Exported/Imported hazardous waste

metric kilotons	2015	2016	2017	2018 ¹
Exported ²	5.1	4.6	4.9	4.5
Imported ³	0.010	0.010	0.005	0.000

1 Excludes Consumer Health

2 Disposal within the EU and the United States.

In 2018, approximately 4% of hazardous waste was shipped internationally.

Waste by disposal method

	2015	2016	2017	2018 ¹
Total waste (metric kilotons)	324²	256²	255²	244
Disposed waste (metric kilotons)	90	85	76²	98
Landfilled waste (metric kilotons)	16	15	13	35
Incinerated waste (metric kilotons)	74	70	63 ²	63
Recycled waste (metric kilotons)	234²	171²	179²	146
Material recycling (metric kilotons)	202 ²	139 ²	149 ²	126
Waste-to-energy (metric kilotons)	32	32	30	20
Recycling rate (%)	72	67²	70²	60

1 Excludes Consumer Health

2 Figure retroactively adjusted.

As in previous years, the total waste generated continues to be heavily influenced by the waste from construction and remodeling activities. Construction, excavation and demolition waste accounted for 31% of our waste in 2018. Around 40 metric kilotons of construction, excavation and demolition waste was recycled.

The following table is part of the non-financial report
Significant spills

	2015	2016	2017	2018 ¹
Total number of significant spills	0	0	0	0

1 Excludes Consumer Health

community

Spending on community involvement

€ million	2015	2016 ^{1,2}	2017	2018 ³
Total spending	100.0	43.0	33.8	35.7

1 Includes Sigma-Aldrich as of 2016

2 From 2016 on, we are separating spending on patient support programs such as our Erbitux® China Patients Assistance Program from our community involvement figures.

3 From 2018 on, we are separating spending on programmes of the Merck Foundation from our community involvement figures.

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.

Community involvement spending by region¹

	Europe	North America	Asia-Pacific (APAC)	Latin America	Middle East and Africa (MEA)
2017					
€ million	8.7	2.9	3.2	0.5	18.5
%	26	9	9	1	55
2018					
€ million	10.1	2.2	2.6	0.7	20.1
%	28	6	7	2	57

1 This table presents the regions across the globe in which we support initiatives. For projects that benefit multiple regions, we have calculated the amount per region by dividing the project spending evenly per country.

2 From 2018 on, we are separating spending on programmes of the Merck Foundation from our community involvement figures.

Focus of our local community involvement¹

%	2015	2016 ^{2,3,4}	2017	2018 ⁵
Global Health	33	35	38	34
Broad Minds: Education and culture	33	36	43	42
Sustainable Solutions: Environment	7	5	4	2
Disaster relief	6	2	2	2
Other	21	22	13	20

1 Based on number of projects

2 Includes Sigma-Aldrich as of 2016

3 Since 2016, we have integrated our global projects into our community outreach figures, specifically the Global Pharma Health Fund, the Merck Praziquantel Donation Program and the Deutsche Philharmonie Merck. This change in approach was due to the increasingly international nature of our efforts. We are spearheading a rising number of global projects that account for a growing percentage of our project portfolio. To ensure maximal accuracy, we are therefore including all international initiatives in our figures as of 2016.

4 From 2016 on, we are separating spending on patient support programs such as our Erbitux® China Patients Assistance Program from our charitable spending figures.

5 From 2018 on, we are separating spending on programmes of the Merck Foundation from our community involvement figures.

Motivations for our community involvement¹

%	2015	2016 ^{2,3,4}	2017	2018 ⁵
Charitable activities	3	4	9	7
Community investment	92	87	84	88
Commercial initiatives in the community	5	9	7	5

1 Based on total spending on all projects

2 Including Sigma-Aldrich as of 2016

3 Since 2016, we have been integrating our global projects into our community outreach figures, specifically the Global Pharma Health Fund, the Merck Praziquantel Donation Program and the Deutsche Philharmonie Merck. This change in approach was due to the increasingly international nature of our efforts. We are spearheading a rising number of global projects that account for a growing percentage of our project portfolio. To ensure maximal accuracy, we are therefore including all international initiatives in our figures as of 2016.

4 As of 2016, we are separating patient support programs such as our Erbitux[®] China Patients Assistance Program from our charitable spending.

5 From 2018 on, we are separating spending on programmes of the Merck Foundation from our community involvement figures.

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 cover 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.